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गुरुकुल कांगड़ी विश्वविद्यालय

विषय संख्या आगत नं० 64968

लेखक Sen S.N.

शीर्षक Bibliography of Sanskrit Works on Astronomy and Mathematics.

सदस्य संख	दिनांक	सदस्य संख्या

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NATIONAL COMMISSION FOR THE COMPILATION OF HISTORY OF SCIENCES IN INDIA

SOURCE MATERIALS SERIES

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A BIBLIOGRAPHY OF SANSKRIT WORKS ON ASTRONOMY AND MATHEMATICS

गुरुकुल पुस्तकालय
गुरुकुल कांगड़ी विश्वविद्यालय

PART I

Manuscripts, Texts, Translations & Studies

COMPILED

R520.16, SEN-B
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By

S. N. SEN

With the research assistance of

A. K. BAG AND S. RAJESWAR SARMA

NATIONAL INSTITUTE OF SCIENCES OF INDIA
NEW DELHI

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FOREWORD

The genesis of this Bibliography and the plan followed in compiling it have been clearly explained in the author's Introduction. Of the two Units established by the National Institute of Sciences of India for preparing lists of source materials for the compilation of the history of various branches of sciences studied in Ancient India, the Unit I has already published a Scientific Synopsis of *Caraka Saṃhitā*, which has received high approbation of the learned public. This, the second publication prepared by Unit II, is a much bigger undertaking and has been done with great care and assiduity. I have no doubt that it will prove to be of great help in compiling the history of astronomy and mathematics in Ancient India.

To prepare a bibliography of ancient Sanskrit manuscripts dealing with astronomy and mathematics with all necessary details such as have been attempted in this work, is really a very difficult undertaking, as it requires a knowledge of Sanskrit as well as mathematics and astronomy. Sri S. N. Sen and his two research assistants deserve our thanks for the able manner in which they have accomplished their task. As Chairman of the Advisory Committee, Ancient Period, of the National Commission for the Compilation of History of Sciences in India, I convey its thanks to them.

Calcutta,
March 30, 1966.
Caitra 9, 1888 Śaka.

R. C. Majumdar.

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INTRODUCTION

The present bibliography of Sanskrit works in astronomy and mathematics, including references to manuscripts, texts, translations and studies, has been prepared under a scheme on the history of sciences sponsored by the National Institute of Sciences of India, with a view to providing source materials for the eventual compilation of a history of sciences in India. This bibliographical study was planned in three parts, of which the first part is here presented, and the two remaining parts to be devoted to notes on Indian astronomers and mathematicians and to abstracts of books, articles and reviews in learned periodicals in European languages bearing on the history of Indian astronomy and mathematics, will follow in due course.

For this work, the National Institute of Sciences of India (NISI) authorized the establishment of a unit at the Asiatic Society, Calcutta, and a Sub-Committee composed of scientists, historians and indologists was appointed by the Society, in accordance with a plan originally adopted by the NISI, to make available the benefit of frequent discussions among experts of many disciplines during the progress of the work. The unit received invaluable help from the members of the Sub-Committee both in the formulation and final execution of the plan of this bibliography, for which I place on record my sincere and grateful thanks. On a more general level the work had the benefit of much useful discussions and suggestions from the History of Science Board of the NISI, for which I record my appreciation and thanks.

In the plan followed in this bibliography, entries in regard to authors as well as titles have been arranged alphabetically. Under each author his works are also arranged alphabetically. The principal information on the work, e.g., a brief description including chapter headings wherever possible, manuscript references including catalogue number, folios, script, date of copying etc., commentators

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and anonymous commentaries, printed text, translations etc. and study, has been given for each title under the author concerned. In the case of an anonymous work, such information is included, for obvious reasons, under the title itself. In addition, the titles of which the authors are known and therefore entered with full particulars under the author have also been separately entered in the alphabetical sequence with the direction 'see x' where x stands for the author. By this arrangement location of a work by title in case the name of the author may not be remembered has been facilitated.

The main idea in emphasizing the entries with all particulars under authors has been prompted by a consideration to give as full a picture as possible in a bibliography of the achievement of an author, reflected, for example, in the number of his works, their availability in Mss, the number of commentaries, the availability of such works in print and/or translations and the extent to which such works, in full or in part, have been the subject of modern studies. Thus, while it will be possible from this bibliography to ascertain how much information is readily likely to be available about any author, it will also reveal areas where such information is deplorably scanty and is still locked up in Mss. yet to be edited and studied. It is believed that for the compilation of the proposed history of sciences in India as far as concerns the history of astronomy and mathematics and also for further researches in the history of development of these subjects as expressed through the medium of the Sanskrit language, such a bibliography will be of more direct assistance.

The entries given under 'Manuscript reference' require some explanation. Take the following example:

BORS/AB. iii. *400*, 18ff. Nāgarī. 1863 A.D.

Here,

BORS/AB. is the abbreviation of 'A descriptive catalogue of Mss in Mithila. Compiled by A. P. Banerji Sastri. The Bihar and

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Orissa Research Society. Patna. 1937'. A list of abbreviations for the manuscripts catalogues used in this study is separately given.

iii	is the volume of the catalogue referred to above.
400	refers to the catalogue number.
18ff	means that the Ms in question has 18 folios.
Nāgarī	means the script of the Ms.
1863 A.D.	indicates the date of copying the Ms.

Under 'Study' where references are given to articles published in serial publications, abbreviations of such serial publications have been employed, and a list of such abbreviations is appended. For example,

BCMS, **19**, 87-94, 1928.

Here,

BCMS	stands for	*Bulletin of the Calcutta Mathematical Society.*
19	,,	volume number.
87-94	,,	page references.
1928	,,	year of publication.

In the preparation of this bibliography, 79 catalogues of Sanskrit manuscripts were consulted. Information given with respect to Mss. is therefore limited to what is contained in the aforesaid catalogues. To that extent the present survey of Mss. attempted in this work needs must be incomplete in view of a considerable amount of manuscript literature, whether already deposited in the libraries or in private collections, remaining yet to be catalogued and described. It is possible that the catalogues consulted may not have exhausted all those that have appeared to date; but every effort has been made to make the bibliography as representative as possible. The bibliography records more or less 660 titles by about 480 authors and about 320 anonymous works.

I place on record my sincere thanks to the National

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Institute of Sciences of India for making available this opportunity of work in an area of growing interest and to the Asiatic Society, Calcutta for varied facilities and cooperation throughout the progress of the work. My thanks are due to the National Library, Calcutta, the Central Library of the Calcutta University, the Library of the Sanskrit College, Calcutta, and the Library of the Calcutta Mathematical Society for permitting the use of their libraries for the work. Last, not the least, I express my grateful thanks to Dr. A. C. Ukil, the first convener of the NISI History of Science Board and to Dr. D. M. Bose, the present convener, for their keen interest, many valuable suggestions and constant encouragement.

Calcutta,
October 2, 1964.
Āśvin 10, 1886 Śaka.

S. N. Sen.

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ABBREVIATIONS FOR THE MANUSCRIPTS CATALOGUES

ADYAR	Alphabetical list of Sanskrit and Prakrit Mss. in the Adyar library, Madras. Edited by the Paṇḍits of the Library. Madras. 1910.
ANUP	Catalogue of the Anup Sanskrit Library. Prepared by Dr. C. Kuṇhan Raja and K. Madhava Krishna Sarma. Bikaner. 5 Vols. 1947, '48.
AS/AB.	A descriptive catalogue of the Sanskrit Mss. in the collections of the Asiatic Society (Govt. Collection) by Ajit Ranjan Bhattacharya, **13,** Jaina Mss. (Sanskrit & Prakrit), Facs. 1. The Asiatic Society. Calcutta. 1958.
AS/HS.	A descriptive catalogue of Sanskrit manuscripts in the Govt. Collection under the care of the Asiatic Society, Bengal by H. Śāstrī. Vol. II. *Vedic* Manuscripts. Calcutta. 1923.
AS/HS & PS	A descriptive catalogue of the Sanskrit Mss. in the collection of the Royal Asiatic Society of Bengal. Vol. 10, part, 1. (Astronomy Mss) by M. M. Haraprasād Śāstrī. Revised and edited by Prabodh Candra Sengupta. Calcutta. 1945.
AS/KBK.	Catalogue of printed books and manuscripts in Sanskrit belonging to the Oriental library of the Asiatic Society, Bengal, compiled by Kuñja Vihārī Kāvyatīrtha under the supervision of H. Śāstrī. Calcutta. 1904.
AS/KBN	An alphabetical list of Jain Mss. belonging to Government in the Oriental library of the Asiatic Society of Bengal, prepared by Pandit Kuñjavihārī Nyāyabhuṣaṇa. Calcutta. 1908.
BANARAS	Catalogue of the Sanskrit Manuscript in the Sanskrit College Library, Banaras with

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	full index. Printed by order of the Government. Allahabad.
BANARAS/TU & SJ.	A descriptive catalogue of Sanskrit manuscripts acquired for and deposited in the Govt. Sanskrit College Library. Saraswati Bhavana. Banaras, during the years 1791-1950, Vol. I, part 1, prepared under the guidence of T. P. Upādhyāya and Subhadra Jhā. 1953.
BC/HS	Catalogue of Mss. in the Bishop's College Library, Calcutta. Prepared by M. M. Haraprasad Śāstrī. Calcutta. 1915.
BERLIN	Die Handschriften Verzeichnisse der Königlichen Bibliothek zu Berlin. Verzeichnisse der Sanskrit Handschriften. von A. Weber. 1853-91.
BHANDARKAR	Bhandarkar's reports in search of manuscripts.
BIK/RM	A catalogue of Sanskrit Mss. in the library of the Maharaja of Bikaner. Ed. Rajendralal Mitra. Calcutta. 1880.
BM/CB	Catalogue of Sanskrit Mss. in British Museum. C. Bendall. 1902.
BN/AC	Catalogue Sommaire des Manuscripts Sanskrits et Pālis de la Bibliothèque Nationale. A. Cabaton. Paris. 1907.
BODLEIAN	Catalogi Codicum Manuscriptorum, Bibliothecae Bodleianae, Pars Octava, Oxonii. Th. Aufrecht. 1954.
BOMBAY/FK	Report on the search of the Sanskrit Mss. in Bombay Presidency by F. Kielhorn. Bombay. 1881.
BORI/DC	Descriptive catalogue of the Government collection of Mss. deposited at the Bhandarkar Oriental Research Institute. Poona.
BORS/AB	A descriptive catalogue of Mss. in Mithila.

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	Compiled by A. P. Banerji Sastri. The Bihar and Orissa Research Society. Patna. 1937.
BU/GD	A descriptive catalogue of the Sanskrit and Prakrit Mss. in the library of the University of Bombay. G. V. Devasthali. Bombay. 1944.
BU/HV	A descriptive catalogue of the Sanskrit Mss. in the library of the University of Bombay. H. D. Velankar. 1953.
BURNELL	Catalogue of a collection of Sanskrit Manuscripts by A. C. Burnell. Part I, Vedic Manuscripts. London. 1869.
CATALOGUS	Catalogus Catalogorum. Th. Aufrecht. 5 parts. Leipzig. 1891, 1896, 1903.
CATALOGUS/N.	New Catalogus Catalogorum. University of Madras. 1949.
CENSUS	A census of Indic Manuscripts in the United States and Canada. Compiled by H. I. Poleman. American Oriental Series. Vol. 12. American Oriental Society. New Haven, Connecticut. 1938.
CP/FK	A catalogue of Sanskrit Mss. existing in Central Provinces. F. Kielhorn. Nagpur. 1874.
CP/HL	Catalogue of Sanskrit and Prakrit Mss. in Central Provinces and Berar by Raibahadur Hiralal. Nagpur. 1926.
CSC/HS & SG	A descriptive catalogue of Sanskrit Mss. in the library of Calcutta Sanskrit College. H. Sastri & S. Guin. 1906.
CU/AMT	A brief catalogue of Sanskrit Mss. in the Post-graduate department of Sanskrit, Calcutta University. A. M. Tarkatirtha. 1954.
FSM/TA	Florentine Sanskrit Mss. Th. Aufrecht. Leipzig. 1892.

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GOS/21	A catalogue of Mss. in the Jaina Bhandaras of Jesalmere. C. D. Dalal and L. B. Gandhi. The Gaekwad Oriental Series no. 21. Barada. 1923.
GOS/76	A descriptive catalogue of Mss. in the Jaina Bhandara at Pattan. C. D. Dalal & L. B. Gandhi. The Gaekwad Oriental Series no 76 Barada. 1937.
GOS/135	Catalogue of Palm-leaf Mss. in the Santinatha Jaina Bhandara, Cambay by Muni Punyavijaya. Part 2. The Gaekwad Oriental Series no. 135. Barada. 1961.
GUJARAT	A catalogue of Sanskrit Mss. contained in the private libraries of Gujarat, Kathiawad, Kachchh, Sindh and Khandes. Compiled under the superintendence of G. Bühler by order of the Government. Fascicles I-IV. Bombay. 1871-73.
HULTZSCH	Reports of Sanskrit Manuscripts in Southern India by E. Hultzsch, Ph.D. Madras. 3 Vols. 1895, 1896, 1905.
IO/AK	Catalogue of Sanskrit and Prakrit Mss. in the Library of India Office. A. B. Keith. London. 1935.
IO/CT & FT	Catalogue of two collections of Sanskrit Mss. preserved in the India Office Library. C. H. Tawney & F. W. Thomas. 1902.
IO/JE	Catalogue of Sanskrit Mss. in the library of India Office. Julius Eggling. London. 1896.
JASB/LXII	The Weber Manuscripts. Another collection of Ancient Mss. from Central Asia by Dr. A. F. R. Hoernlé. *Journal of the Asiatic Society of Bengal.* Vol. 62, part I, pp. 1-41. 1853.
JRAS/1902	Catalogue of the late Prof. Fr. Max-Müller's Sanskrit Manuscripts (acquired in July 1901 for the Japanese University of Tokyo) by Don. M. De. Z. Wickremasingne. *Journal*

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	of the Royal Asiatic Society of Great Britain and Ireland. pp. 611-651. 1902.
JRAS/1912	Catalogue of Stein Collection of the Sanskrit Mss. from Kashmir (deposited at the Indian Institute Library. Oxford): Compiled by Gerard L. M. Clauson with introductory note by Prof. A. A. Macdonell. *Journal of the Royal Asiatic Society of Great Britain and Ireland.* p.p. 587-627. 1912.
JSB/SD	A catalogue of Sanskrit, Prakrit and Hindi works in the Jaina Siddhanta Bhavana, Arrah. Suparshwa Dasgupta. Arrah. 1919.
KANNADA	Kannada-prāntīya tadapatrīya-granthasūcī. Ed. Vidyābhūṣaṇa paṇḍita K. Bhyabali Śāstrī. Mudabidri Bharatiya Jnanapitha Kasi. 1948. (Jain Mss. in Mudabidri Jaina Matha & Jaina Bhavan and private collections).
LEIPZIG/TA	Katalog der Sanskrit Handschriften der Universitäts Bibliothek zu Leipzig. Theodor Aufrecht. Leipzig. 1901.
LU	Catalogue of Oriental Manuscripts in the Lucknow University Library. Kaliprasad. Lucknow. 1951.
M & C/LR	Catalogue of Sanskrit Mss. in Mysore and Coorg compiled for the Government by Lewis Rice. Bangalore 1884.
MAC/HW	Descriptive catalogue of Oriental Mss. in the Mackenzie Collection. H. H. Wilson. Madras. 1882.
MADRAS/D	A descriptive catalogue of Sanskrit Mss. in the Government Oriental Manuscripts Library. Madras.
MADRAS/T.	A Triennial Catalogue of Mss. collected for the Government Oriental Manuscripts Library. Madras.
MYSORE/AM	Classified catalogue of Sanskrit Mss. in the Mysore Government Oriental Library

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	(collected for the Government of Mysore during 1891 to 1893) by A. Mahadeva Sastri. Mysore. 1894.
NEPAL/HS	A catalogue of Palm-leaf & selected paper Mss. belonging to the Durbar Library, Nepal, by Haraprasād Śāstrī. Two Volumes. 1905 & 1915.
NOTICES/HS	Notices of Sanskrit Manuscripts. Edited by M. M. Haraprasāda Śāstrī. Old Series, vol. 10. New Series, vols. 1-4.
NOTICES/RM	Notices of Sanskrit Manuscripts. Edited by Rajendralal Mitra. Old Series, vols. 1-11.
NU/VK	A catalogue of Sanskrit Mss. in the Nagpur University Library. V. W. Karmarkar, Nagpur. 1957.
NWP	A catalogue of Sanskrit Mss. in the private libraries of The North-West Provinces. Compiled by order of the Government of North-West Provinces. 1874-82.
OPPERT	Lists of Sanskrit Manuscripts in private libraries of Southern India. Compiled, arranged and indexed by Gustav Oppert, Ph.D. 2 Vols. Madras. 1880, 1885.
OUDH	Catalogue of Sanskrit Mss. existing in Oudh. Ed. Colin. Browning, Rajendralal Mitra, John Nesfield, Deviprasad etc. 1872-93.
OXFORD	Catalogue of the Sanskrit and Prakrit Mss. in the Indian Institute Library, Oxford. Compiled by A. B. Keith. Oxford. 1903.
PETERSON	Peterson's Reports of the Search for Sanskrit Mss.
PU	Catalogue of Sanskrit Mss. in the Punjab University Library, Lahore. 2 Vols. 1932, 1941.
RAS/BB/HV	A descriptive catalogue of Sanskrit and Prakrit Mss. in the Library of the Bombay Branch of the Royal Asiatic Society. H. D. Velankar.

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RAS/BB/VM	Catalogue of Manuscripts and Books belonging to the Bhau Memorial (deposited in Bombay Branch of the Royal Asiatic Society) V. N. Mandalik & A. F. Moos. Bombay. 1882.
RAS/MW	A catalogue of South Indian Mss. (especially those of Whish collection) belonging to the Royal Society of Great Britain and Ireland. M. Winternitz. London. 1902.
RORI/JM	A classified list of Mss. in the Rajasthan Oriental Research Institute. Jinavijaya Mum. Jodhpur. 1960.
RS/CW	A catalogue of Sanskrit and other Oriental Manuscripts presented to the Royal Society by Sir William and Lady Jones on 23rd. Jan. 1792. Prepared by C. Wilkins. The works of Sir William Jones. Vol. 13. London. 1807.
RTL/MS	Catalogue of Sanskrit Mss. in the Raghunatha Temple Library of Maharaja of Jammu & Kashmir. M. A. Stein.
TANJORE/AB	Classified index to the Sanskrit Mss. in the palace of Tanjore. A. C. Burnell. London. 1880.
TANJORE/PPS	A descriptive catalogue of Sanskrit Mss. in the Tanjore Maharaja Serfoji's Sarasvati Mahal Library. Edited by P. P. S. Śāstrī.
TAYLOR	Catalogue Raisonné of Oriental Manuscripts in the library of the college, Fort St. George in charge of the Board of Examiners. Ed. Rev. William Taylor. Madras. 1857.
TCC/TA	A catalogue of Sanskrit Mss. in the library of Trinity College. Cambridge. Th. Aufrecht. 1869.
TRI/KS	A descriptive catalogue of the Sanskrit Mss. In the H. H. The Maharaja's Palace Library. Trivendrum. Ed. K. Sambaśiva Śāstrī. Vols. 3, 4. Trivendrum. 1938.

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TRI/TG.	A catalogue of Sanskrit Mss. collected by T. Ganapati Śāstrī. Published under the authority of the Government of H. H. The Maharaja of Travancore. Trivendrum. 7 Vols. 1912-23.
UDAIPUR	A catalogue of Manuscripts in the Library of H. H. The Maharana of Udaipur (Mewar). Compiled by M. L. Menaria, M. A. Itihas Karyalaya. Udaipur. 1943.
UJJAIN	Catalogue of Oriental Manuscripts (collected till the end of March 1935 and preserved in the Oriental Mss. library). Ujjain. 1936.
VSP/CC	A descriptive catalogue of the Sanskrit Mss. in the Vaṅgīya Sāhitya Pariṣad by Chintaharan Chakravarti. 1935.
VVRI/VB	Catalogue of Viśveśvarānand Vedic Research Institute Manuscript Collection. Viśva Bandhu. Hoshiarpur. 1959.
ZDMG/33	Liste der indischen Handschriften in Besitze des Prof. H. Jacobi in Munster. Zeitschrift der Deutschen Morgenländischen Gesellschaft. Vol. 33. p. 693.
ZDMG/42	Two lists of Sanskrit Mss. together with some remarks on my connection with the search for Sanskrit Mss.—G. Bühler. 1. A classified list of my private collection of Indian Mss. 2. A rough list of Mss. bought and copied for the Government of Bombay during the years 1860-1862. Zeitschrift der Deutschen Morgenländischen Gesellschaft. Vol. 42. pp. 530-553.
ZDMG/58	Sanskrit Handschriften (presented to India Office by Sir Surindra Mohan Tagore in 1902) Catalogue by Th. Aufrecht. Zeitschrift der Deutschen Morgenländischen Gesellschaft. Vol. 58. pp. 525-538.

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ABBREVIATIONS OF PERIODICALS

A	*Archeion.*
ABORI	*Annals of Bhandarkar Oriental Research Institute.*
AGM	*Abhandlungen zur Geschichte der Mathematik.*
AJP	*American Journal of Philology.*
AM	*Archiv der Math.*
AMM	*American Mathematical Monthly.*
AMP	*Archiv d. Math. u. Physik.*
AO	*Acta Orientalia.*
AR	*Asiatick Researches.*
ASI/AR	*Archaeological Survey of India, Annual Report.*
ASI/M	*Memoirs of the Archaeological Survey of India.*
ASI/NIS	*Archaeological Survey of India, New Imperial Series.*
ASM	*American Scientific Monthly.*
BCMS	*Bulletin of the Calcutta Mathematical Society.*
BI/AS	*Bibliotheca Indica, Asiatic Society of Bengal.*
BM	*Bibliotheca Mathematica.*
BMA/ALU	*Bulletin of the Mathematical Association, University of Allahabad..*

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BNISI	*Bulletin of the National Institute of Sciences of India.*
BSOS	*Bulletin of the School of Oriental Studies.*
CENTAURUS	*Centaurus.*
CRCIP/II	*Comptes Rendus du 11me Congrèss internationale de Philosophie.*
ER	*Edinburg Review.*
GANITA	*Ganita.* Formerly, *Proceedings of the Benares Mathematical Society.*
GIPA	*Grundries. der Indo-Arischen Philologie und Alterthumskunde.*
IA	*Indian Antiquary.*
IC	*Indian Culture.*
IE	*Indian Education.*
IHQ	*Indian Historical Quarterly.*
IS	*Indische Studien.*
ISIS	*Isis.*
JA	*Journal Asiatique.*
JAOS	*Journal of the American Oriental Society.*
JAS	*Journal of the Asiatic Society.*
JASB	*Journal of the Royal Asiatic Society of Bengal.*
JASB	*Journal & Proceedings of the Asiatic Society of Bengal.*

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ABBREVIATIONS OF PERIODICALS

JASGBI	*Journal of the Asiatic Society of Great Britain & Ireland.*
JBBRAS	*Journal of the Bombay Branch of the Royal Asiatic Society.*
JBORS	*Journal of the Bihar and Orissa Research Society.*
JDL/CU	*Journal of the Department of Letters of the Calcutta University.*
JDMV	*Jahresbericht der Deutschen Math. Verein.*
JIMS	*Journal of the Indian Mathemetical Society.*
JOIB	*Journal of the Oriental Research Institute, Mss. University of Baroda.*
JORM	*Journal of Oriental Research, Madras.*
JUPHS	*Journal of the United Provinces Historical Society.*
JRAS	*Journal of the Royal Asiatic Society.*
MONIST	*Monist.*
MR	*Modern Review.*
OSIRIS	*Osiris.*
PANDIT	*Pandit.*
PB	*Prabuddha Bhārat.*
PBMS	*Proceedings of the Benares Mathematical Society.* Renamed *GANITA.*
PICM/III	*Proceedings of the Third International Congress of Mathematics.*
PO	*Poona Orientalist.*

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POPSM	*Popular Science Monthly.*
PTOC/II	*Procegdings and Transactions of the Second Oriental Conference.*
QJMS	*Quarterly Journal of the Mythic Society.*
QSGM	*Quellen und Studien zur Geschichte der Mathematik*
RGS	*Revue générale des Sciences (pures et appliquées)*
ROC	*Revue de l'orient Chretian.*
RPI	*Revue Positiviste Internationale.*
RQS	*Revue des Questions Scientifiques.*
SC	*Science.*
SCI	*Scientia.*
SG	*Schlesische Gesellschaft.*
SM	*Scripta Mathematica.*
TAPS	*Transactions of the American Philosophical Society.*
TASJ	*Transactions of the Asiatic Society of Japan.*
TLSM	*Transactions of the Literary Society of Madras.*
TRAS	*Transactions of the Royal Asiatic Society.*
TRASB	*Transactions of the Royal Academy of Sciences at Berlin,* 1862.
TRSE	*Transactions of the Royal Society of Edinburgh.*
ZDMG	*Zeitschrift d. deutsch. morgenländischen Gesellschaft.*

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ZMNWU	*Zeitschrift math. u. Naturwiss. Unterricht.*
ZMP	*Zeitschrift Math. u. Physik.*
ZMU	*Zeitschrift für Math. Unterricht.*

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A BIBLIOGRAPHY OF SANSKRIT WORKS ON ASTRONOMY AND MATHEMATICS

PART—1

Manuscripts, Texts, Translations and Studies

ABBAYA KAVI (c. 1807 A.D.)

Gaṇitāmṛta. गणितामृत 1807 A.D.

An astronomical work containing the following 5 chs. *viz.*, (i) Madhyagrahādhyāya, (ii) Sphuṭagrahādhyāya, (iii) Pātādhyāya, (iv) Candragrahaṇādhyāya, and (v) Sūryagrahaṇādhyāya.

Manuscript reference:

MADRAS/D. Supplemental xxviii, *15882*, 18 ff. Telugu. Contains a Telugu commentary.

MADRAS/T. Vol. i. part i, Sanskrit B, *393(a)*, ff.1a-10b. Telugu. Contains a Telugu commentary.

Abhinavatāmarasa. see PURUṢOTTAMA BHAṬṬA.

Abhīṣṭasāraṇī. अभीष्टसारणी

An anonymous astronomical work containing mainly tables.

Manuscript reference:

AS/HS & PS. x. *6826*, 40 ff. Nāgarī.

ACALĀCĀRYA

Jyotirvida-śṛṅgāra. ज्योतिर्विदश्रृङ्गार

Manuscript reference:

GUJARAT. iv. p. 138, *140.*

ACYUTA

Karaṇottama. करणोत्तम

A karaṇa work in 5 chs.

Manuscript reference:

MADRAS/T. vol. i. part i, Sanskrit C, *663(a)*, ff. 1a-16a Grantha; *663b*, ff. 16b-19b. Grantha.

Anonymous commentary:

Vivaraṇa.

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ACYUTA BHAṬṬA, MIHIRĀCĀRYĀCYUTABHAṬṬA s.o. Sagara Bhaṭṭa (first half of 15th century)

Bhāsvatī-ratnadīpikā or *Bhāsvatī-ratnamālā* or *Bhāsvatīkārtharatnamālikā*. भास्वतीरत्नदीपिका, भास्वतीरत्नमाला, भास्वतीकार्थरत्नमालिका 1505 A.D. or 1534 A.D.

A commentary on the *Bhāsvatī* of Śatānanda. It contains an appendix on *meghajñāna*, "not explained in its proper place in the first *khaṇḍa* which is adduced from another book by Acyuta Śarman". From the statement given in the commentary, its date of composition appears to lie between Śaka 1427 and 1456 (1505 and 1534 A.D.)

Manuscript reference:

10/JE. v, *2918*, 43 ff. Bengali.

Adhimāsoḍāharaṇa. see RATNAKAṆṬHA.

Agaṇitacāra. अगणितचार

An anonymous work containing a set of astronomical tables for determining without actual calculations the movements of the planets with reference to Mars (*Kujaparivṛtti*), Mercury (*Budhaparivṛtti*), Jupiter (*Guruparivṛtti*) and Venus (*Śukraparivṛtti*).

Manuscript reference:

MADRAS/D. xxiv. *13382*, 16ff.

Ahargaṇakrama. अहर्गणक्रम

An anonymous astronomical work for counting the *tithis* and *ahargaṇas* from a particular epoch of the Kaliyuga to a desired date.

Manuscript reference:

LEIPZIG/TA. *1080*, 3 ff. 1750 A.D.

Ahargaṇanādyānayana. अहर्गणनाद्यानयन

An anonymous astronomical work used for the preparation of the calendar.

Manuscript reference:

MADRAS/D. xxiv. *13384*, 32 ff. Telugu.

Ahibalacakra. see NARAHARI.

AHOBILANĀTHA (earlier than 1567 A.D.)

1. *Ahobilanātha-siddhānta*. अहोबिलनाथसिद्धान्त

Manuscript reference:

OPPERT. ii. *1946*, 20 ff. Telugu.

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2. *Ahobilanāthīya.* अहोबिलनाथीय

Manuscript reference:
OPPERT. ii. *1947.* 82 ff. Telugu.

3. *Grahatantra.* ग्रहतन्त्र

An astronomical work dealing with the following 8 chs, *viz*, (i) Madhyagrahādhikāra, (ii) Sphuṭādhikāra, (iii) Pātādhikāra, (iv) Upakaraṇādhikāra, (v) Somagrahaṇādhikāra, (vi) Sūryagrahaṇādhikāra, (vii) Valilekhanādhikāra and (viii) Śṛṅgonnatyadhikāra. From the date of its commentary *Grahatantravivaraṇa* by Veṅkaṭayajvā written between 1567 and 1627 A.D., *Grahatantra* must have been written before 1567 A.D.

Manuscript reference:
MADRAS/T. vol. i. part I. sanskrit B, *437(b)*, ff. 84a-97a. Telugu.

Commentator:
Veṅkaṭayajvā.

Ahobilanātha-siddhānta. see AHOBILANĀTHA.

Ahobilanāthīya. see AHOBILANĀTHA.

AHOṢAKA DEVA

Līlāvatī-vyākhyā. लीलावतीव्याख्या

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:
RAS/BB/VM. p. xxix.

AJITADEVA SŪRI. pupil of Maheśvara Sūri (?)

Lokasāra-yantra. लोकसारयन्त्र

A work on astronomical instruments in Prakrit and Sanskrit.

Manuscript reference:
RAS/BB/HV. *260*, 1 ff. Nāgarī. Incomplete.

Akṣaracintāmaṇi. see ŚIVA.

ALLANĀRYA SŪRI. see KALPAKURTI ALLANĀRYA SŪRI

ĀMARĀJA.

Vāsanābhāṣya. वासनाभाष्य

A commentary on the of *Khaṇḍakhādya* Brahmagupta.

Printed text, translations etc.
Khaṇḍakhādyaka with *Vāsanābhāṣya* by Āmarāja Ed. with introduction by Babua Misra, Calcutta Univ. Calcutta, 1925.

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AMAREḌYA, s.o. Gosvāmī.

Karṇāṭa-ṭīkā. कर्णाटटीका

A commentary on the *Sūryasiddhānta* in Kanarese.

Manuscript reference:

MADRAS/D. xxiv, *13512*, 268 ff. Telugu & Nāgarī.

AMAREŚA

A Kanarese commentator on the *Karaṇaprakāśa* of Brahmadeva Gaṇaka. See Brahmadeva Gaṇaka.

Manuscript reference:

10/AK. ii. part i, *6304*, 58 ff. Nāgarī (?) 18th. century.

AMBĀRAMA

Siddhāntādarśa. सिद्धान्तादर्श

A commentary on the *Siddhānta-cūḍāmaṇi* of Sadānanda.

Manuscript reference:

10/AB. ii. part ii, *8053*, 22 ff. Nāgarī. 1790 A.D.

Amṛtakūpikā. see SŪRYADĀSA, s.o. Jñānarāja.

Amṛtasāgarī. see GAṄGĀDHARA, s.o. Govardhana.

ĀNANDA MUNI

Gaṇitasāroddhāra. गणितसारोद्धार

Manuscript reference:

GUJARAT. iv. p. 122, *54*, 66 ff. 1822 A.D.

ANANTA BHAṬṬA

Tithi-dīpikā. तिथिदीपिका

Manuscript reference:

CENSUS, *3099*, 6 ff. 1560 A.D.

Aṅkādarśa. see KṚPĀRĀMA MUKHOPĀḌHYĀYA

Aṅkagrantha. see HARṢA DĪKṢITA

Anupamahodadhi. see VĪRASIṂHA GAṆAKA, s.o. Kāśīrāja.

ĀPADEVA

Grahapīṭhamālā. ग्रहपीठमाला

Manuscript reference:

GUJARAT. iv. p. 126, *70*, 10 ff. 1746 A.D.

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ĀPASTAMBA. (c. 800-500 B.C.)

1. *Āpastamba-śulbasūtra.* आपस्तम्बशुल्बसूत्र (circa 800-500 B.C.)

The *Śulba-sūtra* of Āpastamba comprises 223 sūtras or rules for the construction of sacrificial altars and envisages geometrical rules and mathematical ideas of considerable importance. It is among the earliest of the *Śulbas*, being posterior to Baudhāyana, a much larger and also older work. It is broadly divided into six sections or *paṭalas*, each subdivided into a number of chapters or *adhyāyas*, *e.g.*, the 1st. section into 3 chapters, the 2nd. into 4, the 3rd. into 3, the 4th. into 4, the 5th. into 3 and the 6th. into 4 chapters. The rules mainly describe various types of *vedis*, their spatial magnitudes, relative positions and such other constructional details and provide geometrical propositions and rules for achieving these details.

Manuscript reference:

BANARAS/TU & SJ. p. 380, *4179*, 11 ff. Nāgarī.
PU. i, p. 39, *92*, 14 ff.
TANJORE/AB. p. 15, *97*, 203 ff. Nāgarī. A part of the work contains the *Śulbasūtra*.
VVRI/VB. p 74, *13*, 19 ff. Nāgarī.

Commentators:

Gopāla Yajvā, Kapardisvāmī, Karavindasvāmī, Sundararāja, Sundarasūri.

Printed texts, translations etc.

Āpastamba Śulba. Edited and published by A. Bürk, with German translation, notes and comments, some extracts from the commentaries of Kapardisvāmī, Karavindasvāmī and Sundararāja and diagrams together with an introduction. *ZDMG*, **55,** 543-591, 1901 and **56,** 327-391, 1902.

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Āpastamba-Śulba Sūtra with commentaries of Kapardiswāmiñ, Karavinda and Sundararāja. Ed. by D. Śrinivāsabhār and Vidwan S. Narasimhachar, Mysore, Mysore Sanskrit Series No. 73, 1931.

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Apte, R. N. 'Some points connected with the constructive geometry of the Vedic altars', *ABORI*, **8,** part 1 & 2, 1-16, 1926.

Bürk, A. 'Das Âpastamba Śulba Sūtra', *ZDMG*, **55,** 543-91, 1901; **56,** 327-91, 1902.

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Āpastamba Savyākhyā. see KARAVINDASVĀMĪ.

Āpastamba Savyākhyā. see SUNDARARĀJA.

Āpastamba Śulba Sūtra. see ĀPASTAMBA.

Āpastamba Śulba Sūtrabhāsya. see KAPARDISVĀMĪ.

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APPAYA s.o. Marla Perubhaṭṭa (c. 1491 A.D.)

Grahacandrikā-gaṇita. ग्रहचन्द्रिकागणित (1491 A.D.)

A work on astronomy in 7 chs., *viz*, (i) Madhyagrahādhikāra, (ii) Sphuṭagrahādhikāra, (iii) Vakra vakra-tyāgodayāstamayādhikāra, (iv) Pātādhyāya, (v) Lagnādhyāya, (vi) Candragrahaṇādhyāya, and (vii) Sūryagrahaṇādhyāya.

Manuscript reference:

MADRAS/T. Vol. iii. part 1. Sanskrit C. p. 4156, *337(d)*, ff. 67b-76b. 1916-17 A.D.

APŪCHA JHĀ, elder brother of Paṇdit Khuddi Jhā of Kailakh.

Makaranda-karaṇa. मकरन्दकरण

Manuscript reference:

BORS/AB, iii, *245*, 7 ff. Maithili. Incomplete.

Ārca Jyautiṣa & Yājuṣa Jyautiṣa. see SUDHĀKARA DVIVEDIN.

ĀRYABHAṬA I (b. 476 A.D.)

1. *Āryabhaṭīya, Āryasiddhānta (laghu).* आर्यभटीय, आर्यसिद्धान्त (लघु) 449 A.D.

A famous Indian work on mathematics and astronomy, divided into following four broad sections, *viz*, (i) *Daśagītikā or* the ten Gīti stanzas, (ii) *Gaṇitapāda* or mathematics, (iii) *Kālakriyā* or the reckoning of time, (iv) *Gola* or the sphere.

Manuscript reference:

ANUP iv. p. 341, *41*, 27 ff; *42*, 2 ff, *Daśagītikā* only; *43*, 9 ff.
AS/HS & PS. x. *6827*, 8 ff.
BERLIN, ii. part i. *1730*, 7 ff. 1689 A.D.
BODLEIAN. *769*, ff. 49-55.
BU/GD. i. *330*, 6 ff. Nāgarī; *331*, 8 ff. Nāgarī; *332*, 10 ff. Nāgarī; *333*, 4 ff. Nāgarī; *334*, 17 ff. Nāgarī; *335*, 35 ff. Nāgarī.
CENSUS. *4668*, 20 ff. Grantha. 1909-12 A.D.; *4669*, 9 ff. Nāgarī; *4670*, 9 ff. Nāgarī. *Daśagītisūtra* only.
CSC/HS & SG. ix. 2. 7 ff. Nāgarī, incomplete.
IO/AK. ii. part i, *6263*, Malayalam. Fragment.
IO/JE. v. *2767*, ff. 7+80 Grantha.
LU. 25.
M & C/LR. *261*, Nāgarī.
MADRAS/D. xxiv. *13385*, 12 ff. Grantha; *13386*, 12 ff. Nāgarī, lacks *Kālakriyā*; *13387*, 12 ff. Telugu; *13388*, 11 ff. Telugu; *13389*, 192 ff. Grantha; *13390*, 242 ff. Nāgarī; *13391*, 132 ff. Telugu, incomplete; *13392*, 123 ff. Nāgarī; *13393*, 254 ff. Grantha; *13394*, 132 ff. Grantha; *13395*, 106 ff. Nāgarī.

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MADRAS/T. vol. iii. part 1. Sanskrit C. *3070* (c), ff 145b-150b.

MYSORE/AM. p. 49, *A 25*, 72 ff. Telugu, incomplete.

NOTICES/RM, iv. *1566*, 8 ff.

TRI/KS. iii. *870*, 217 ff. Malayalam, incomplete.

Commentators:

Bhāskara I, Bhūtaviṣṇu, Koṭikalapūdi Kodaṇḍarāma, Nīlakaṇṭha Somasutvan, Parameśvara, Someśvara, Sūryadēva, Yallaya.

Anonymous Commentaries:

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SENGUPTA, P. C. 'Āryabhaṭa's lost work', *BCMS*, **22**, 115-20, 1930.

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SINGH, AVADESH NARAYAN. 'On the Indian method of root extraction', *BCMS*, **18,** 123-40, 1927.

SMITH, D. E. '*History of Mathematics*', **1,** 152-56, **2,** 379, 387, 444, 608, 615, 626; Dover edition, 1958.

WHISH, C. M. 'De la Notation Alphabetique des Indiens', *JA*, Series 2, **16,** 116-30, 1835.

WINTERNITZ, M. *Geschichte der indischen Litteratur*, **3,** 562-63, 573, Leipzig, 1922.

2. *Sūryasiddhāntaprakāśa.* सूर्यसिद्धान्तप्रकाश

A commentary on the *Sūryasiddhānta* by Āryabhaṭa 1.

Manuscript reference:

MAC/HW, p. 162, *5*, Grantha.

ĀRYABHAṬA 11. (950 A.D.)

Āryasiddhānta, Āryabhaṭasiddhānta or *Mahāsiddhānta.*
आर्यसिद्धान्त, आर्यभटसिद्धान्त, महासिद्धान्त

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A *Siddhānta* work in 18 chs. *viz.*, (i) Madhyagati, (ii) Parāśaramatāntarādhikāra, (iii) Spaṣṭagatyadhyāya, (iv) Tripraśnādhyāya, (v) Candragrahaṇādhyāya, (vi) Sūryagrahaṇa, (vii) Śṛṅgonnatyadhyāya, (viii) Chādyakādhyāya, (ix) Udayāstādhyāya, (x) Grahachāyādhyāya, (xi) Grahayutyadhyāya, (xii) Bhagrahayutyadhyāya, (xiii) Pātādhyāya, (xiv) Golādhāye praśnādhikāre madhyamapraśna, (xv) Pātyuttarādhyāya, (xvi) Golādhāye bhūvanakośapraśna, (xvii) Madhyagativāsanā, and (xviii) Golādhyāye kuṭṭakādhyāya.

Manuscript reference:

AS/HS & PS. x *6828*, 51 ff. Nāgarī, 19th. century; *6829*, 37 ff. Nāgarī; *6830*, 38 ff. Nāgarī.
BERLIN. ii. part i, *1731*, 45 ff.
BN/AC. i. *983(11)*, Nāgarī, 1860 A.D.
BODLEIAN. *770*, 40 ff. Nāgarī. 1815 A.D.
BU/GD. i. *325*, 14 ff. Nāgarī, 1860 A.D; *326*, 30 ff. Nāgarī, 1863 A.D; *327*, 28 ff. Nāgarī. 1654 A.D; *328*, 55 ff. Nāgarī. 1868 A.D.; *329*, 50 ff. Nāgarī.
NOTICES/RM. iv. *1568*, 37 ff. Nāgarī.
TCC/TA. p. 39. 41 ff. Nāgarī. 1814 A.D.

COMPLIMENTARY

Commentators:

Someśvara, Sudhākara Dvivedin.

Printed text, translations etc.

Mahāsiddhānta, edited with his own commentary by Sudhākara Dvivedin, Benares Sanskrit Series no. 36, Benares, 1910.

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DAS, SUKUMAR RANJAN. 'Precession and Libration of the Equinoxes in Hindu astronomy'. *JASB*, ns. 23, no. 3, 403-13, 1927.
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FLEET, J. F. 'The Kaṭapayadi notation of the second Āryasiddhānta'. *JRAS*, 459-62, 1912.
HALL, FITZ EDWARD. 'On the Āryasiddhānta with additional note on Āryabhaṭa and his writings'. *JAOS*, **6,** 556-64, 1860.
KAYE, G. R. 'Two Āryabhaṭas', *BM*, **10,** 289-92, 1910.
SINGH, A. N. 'Hindu Trigonometry', *PBMS*, ns. 1, 77-92, 1939.

Āryabhaṭasiddhānta. see ĀRYABHAṬA 11.

Āryabhaṭa-sūtrārdha-prakāśikā. see SŪRYADEVA YAJVAN.

Āryabhaṭatantragaṇita. see KODAṆḌARĀMA s.o. Veṅkaṭa Kṛṣṇa.

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Āryabhaṭīya. see ĀRYABHAṬA 1.

Āryabhaṭīyabhāṣya. see NĪLAKAṆṬHA SOMASUTVAN

Āryabhaṭīya-sūtrabhāṣya. see BHĀSKARA 1.

Āryabhaṭīya-tantrabhāṣya. see BHĀSKARA 1.

Āryapakṣagrahadīpa. आर्यपक्षग्रहदीप

Manuscript reference:
GUJARAT. iv. p 116, *13*, 12 ff.

Āryasiddhānta. see ĀRYABHAṬA 11.

Āryasiddhānta (laghu). see ĀRYABHAṬA 1.

Āryasiddhāntatulyakaraṇa. see VĪRASIṂHA GAṆAKA.

Āryabhaṭīya-vyākhyā. आर्यभटीयव्याख्या
A commentary on the *Āryabhaṭīya* of Āryabhaṭa 1.
Manuscript reference:
MAC/HW. p 164, *13*, Grantha.
MADRAS/T. vi. part i. Sanskrit, *5261*, 142 ff Nāgarī. 1926-27 A.D.; x. Sanskrit A, *6485a*, ff. 46a-62a. Nāgarī.
TCC/TA. p 37, 16 ff. Nāgarī, 1802 A.D.

Āryabhaṭīya-vyākhyāna. see YALLAYA s.o. Śrīdharācārya.

ĀŚĀDHARA GAṆAKA

1. *Grahagaṇita.* ग्रहगणित
Manuscript reference:
GUJARAT. iv. p 124, *63*, 4 ff.

2. *Grahajñāna.* ग्रहज्ञान 1132 A.D. (?).
On the motion of the planets.
Manuscript reference:
IO/JE. v. *2922*, 5 ff. Nāgarī. 1637 A.D.
Anonymous Commentary:
Grahasāriṇī.

Astodayādhikāra. अस्तोदयाधिकार
An anonymous astronomical work on rising and setting of planets.
Manuscript reference:
RAS/BB/HV. *215*, 14 ff. Nāgarī.

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Aticāranirṇaya. see MAHEŚA ṬHAKKURA.

Avacūrṇī. see GUṆARATNA SŪRI.

Ayanāṃśādikaraṇavidhi. अयनांशादिकरणविधि
An anonymous astronomical work.
Manuscript reference:
RORI/JM. ii. p 85, *7*, 24 ff. 1733 A.D.

Āyanatattva. see ḌHUṆḌHIRĀJA s.o. Nṛsiṃha.

Ayanavāda. see RĀMADATTA.

BĀBĀ DAIVAJÑA s.o. Rāma and brother of Śiva.
Pañcāṅgasiddhi. पञ्चाङ्गसिद्धि
Manuscript reference:
CENSUS. *4726*, ff. 3-7, 1649 A.D.
RORI/JM. ii. *5764*. 5 ff. 1907 A.D.

BĀBUĀ SŪRI
Karaṇa-pañcāṅga. करणपञ्चाङ्ग
Manuscript reference:
RAS/BB/VM. p xliv.

Bakhshālī Manuscript. (3rd.-4th. century A.D.)
The Bakhshālī Ms. was found in Bakhshālī village, near the city of Peshawar, in the course of an excavation in 1881. It was written on brich-bark. A considerable portion of the manuscript had been destroyed and only some 70 leaves of birch-bark, of which a few again were mere scraps, survived at the time of its discovery. It is now in the Bodleian Library, Oxford. R. Hoernlé published two accounts of it,—a short one in 1883 and a fuller one in 1886. The last description was republished with some additions in 1888. The work was edited by G. R. Kaye, with a comprehensive introduction and published by the Government of India with photographic facsimilies and transliteration of the text. Hoernlé, Datta and others believed the date of the Ms. to be between the 3rd. and the 4th. century A.D., whereas Kaye expressed the view that the Ms. could not belong to a date earlier than the twelfth century A.D. It is a mathematical work containing rules, with illustrative examples and their solutions, for arithmetical, algebraic and geometrical (including mensuration) operations. The major portion deals with arithmetic, e.g., fractions, square roots, progressions, income and expenditure,

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profit and loss, computation of gold, interest, rule of three, and summation of complex series. The discussion of algebraic operations includes simple equations, simultaneous linear equations, quadratic, linear equations, and indeterminate equations of the second degree. Problems relating to mensuration and miscellaneous subjects have also been dealt with.

Printed text, translations etc.

The Bakhshālī Manuscript—a study in medieval mathematics. By G. R. Kaye. Part 1: Introduction; Part 11: The Text; Part 111: The Text Rearranged. Archaeological Survey of India. New Imperial Series, Vol. 43, Parts 1, 11 & 111, 1927-35.

Study:

CHAKRABARTY, GURUGOVINDA. 'The growth and development of progressive series in India,' *JDL/CU.* **24,** 1-18, 1934.

DATTA, B. 'The Bakhshālī mathematics,' *BCMS*, **21,** 1-60, 1929.

HOERNLÉ, A. F. R. 'Notices under 'History of Asiatic Society for 1882'. *IA*, **12,** 89-90, 1883.

HOERNLÉ, A. F. R. 'Verhandlungen des siebenten internationalen orientalisten congresses', Arische Section, 127, Wein, 1886.

HOERNLÉ, A. F. R. 'The Bakhshālī Manuscript', *IA*, **17,** 33-48, & 275-79, 1888.

KAYE, G. R. 'The Bakhshālī Manuscript', *JASB*, **8,** 349-61, 1912.

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SARTON, GEORGE. *Introduction to the History of Science*, **2,** part 1, 214-15, Baltimore, Reprint, 1950.

SMITH, D. E. *History of Mathematics*, **1,** 164; **2,** 70, Dover ed., 1958.

BALABHADRA (c. 1656 A.D.)

Hāyanaratna. हायनरत्न 1656 A.D.

Manuscript reference:

CP/FK. p. 246, *187*, 67 ff. 1849 A.D.
LU. 33.

BALABHADRA of Umānagara, s.o. Vasanta and grandson of Vimalākara.

Bālabodhinī. बालबोधिनी 1544 A.D.

A commentary on the *Bhāsvatī* of Śatānanda.

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Manuscript reference:
BANARAS. p. 261, *76*. ff. 1-17.
BU/GD. i, *373*, 24 ff. Nāgarī.
CSC/HS & SG. ix, *81*, 44 ff. Nāgarī, 1796 A.D.
NOTICES/RM. ii, *785*, 64 ff.
NWP. ii, p 117, *23*, 41 ff. Nāgarī.

BALABHADRA (c. 1772-82 A.D.)

Patraprakāśa or *Patradīpikā*. पत्रप्रकाश, पत्रदीपिका
Astronomical tables according to the calculations of the *Sūryasiddhānta*.

Manuscript reference:
IO/JE. v, *2973*, 84 ff. Nāgarī.

COMPLIMENTARY

Bālabodha. see HARIKARṆA s.o. Sundara Śarmaṇ.

Bālabodha. see MUÑJĀDITYA.

Bālabodhinī, comm. by Balabhadra on *Bhāsvatī* of Śatānanda. see BALABHADRA.

Bālabodhinī. see KṚPĀRĀMA MIŚRA. s.o. Lakṣmīnārāyaṇa.

BĀLAGOVINDA.

Grahalāghava-ṭīkā. ग्रहलाघवटीका
A commentary on the *Grahalāghava* of Gaṇeśa Daivajñā.

Manuscript reference:
LU. *32*.

BĀLAKṚṢṆA, s.o. Yādava, s.o. Rāmakṛṇṣa, s.o. Nārāyaṇa, s.o. Rāmajit.

Jaimini-sūtrabhāṣya. जैमिनिसूत्रभाष्य
A commentary on the *Jaiminisūtra*, the astronomical aphorisms of Jaimini.

Manuscript reference:
GUJARAT. iv. p. 136, *129*, 144 ff. 1866 A.D.

BĀLAKṚṢṆĀNANDA. see KṚṢṆĀNANDA.

BĀLAMUKUNDA

Siddhāntarahasya. सिद्धान्तरहस्य
An astronomical treatise.

Manuscript reference:
VVRI/VB. *262*, 74 ff. Nāgarī

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Bālaprabodha. see HARIKARṆA, s.o. Sundara Śarmaṇ.

Bālaprabodha. see YALLAYA.

BAUDHĀYANA (c. 800-500 B.C.)

Baudhāyana-śulbasūtra. बौधायनशुल्बसूत्र

It is the earliest and the largest of the Śulba works. It comprises 525 sūtras and is divided into three chapters. The first chapter contains 116 sūtras which give geometrical propositions necessary for the construction of the sacrificial altars and deal briefly with the relative positions and spatial magnitudes of various *vedīs*. The second chapter consists of 86 sūtras of which the major portion is devoted to the description of the spatial relations in the different constructions of the *Agnis* and the remaining portion explains the construction of several *Agnis*. The third chapter in 323 sūtras, describes mainly the construction of various types of *Agnis*. The work is of considerable importance owing to the various mathematical rules and principles implied in the descriptions and rules concerning the sacrificial altars, some of which involve irrational numbers, the so-called Pythagorean theorem, squaring the circle, indeterminate problems and elementary treatment of surds.

Manuscript reference:

AS/HS. p. 503, *582.*
AS/KVK. p. 121, two copies.

Commentators:

Dvārakānātha, Vyaṅkaṭeśvara Dīkṣita.

Anonymous commentary.

Baudhāyana-śulba-sūtra-vyākhyā.

Printed text, translations etc.

Baudhāyana Śulba, published by G. Thibaut with English translation, critical notes, extracts from the commentary of Dvārakānātha Yajvā and a few diagrams. *PANDIT*, old series **9** and **10,** 1874-5; ns. **1,** Benares, 1877.

Baudhāyana Śulba. The text is printed in the *Baudhāyana Śrauta Sūtra*, being the 30th. chapter of it, edited by W. Caland, in three volumes, Calcutta, 1904, 1907, 1913.

Study:

APTE, R. N. 'Some points connected with the constructive geometry of the Vedic altars', *ABORI*, **7,** part 1 & 2, 1-16, 1926.

CAJORI, F. *History of Mathematics*, 2nd. revised & enlarged edition, 84-86, New York, 1958.

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CANTOR, M. *Vorlesungen über die Geschichte der Mathematik*, **1,** 3, 636-45, 1907.
CHAKRABARTY, GURUGOVINDA. 'On the earliest Hindu methods of quadrature,' *JDL/CU*, **24,** 23-28, 1934.
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DATTA, B. *The Science of Śulba*, a study in early Hindu geometry. Calcutta University, 1932.
DATTA, B. *Vedic Mathematics*, Ramakrisna Centenary Committee: Cultural Heritage, **3**, 378-401, 1937.
DRENCKHAHN, FRIEDRICH. 'Sur Zirkulatur des Quadrats und Quadratur des Kreises in den Śulba Sūtra', *JDMV*, **46,** 1-13, 1936.
GANGULY, SARADAKANTA. 'On the Hindu names for the rectilinear geometrical figure', *JASB*, **26,** 283-90, 1930.
LEVI, B. 'Osservazioni et congetture sopra la geometria degli idiani', *BM*, **9,** 97-105, 1908-9.
LÖSCHHORN, K. 'Über das alter des Pythagoräischen Lehrsatzes', *ZMU*, **33,** 183, 1902.
MAZUMDAR, N. K. 'On the different śulba-sūtras', *PTOC/11*, 561-64, Calcutta, 1922.
MÜLLER, C. 'Die Mathematik der śulba-sūtra', *AGM*, **7,** 173-204, 1929.
SENGUPTA, P. C. 'Time indications in the *Baudhāyana Śrauta sūtra*', *JASB*, **7,** 3rd. series, 207-214, 1941.
SHAMASASTRY, R. 'RoHiTA—a sure test of the Vedic cycle', *PO*, **5,** no. 4, 161-85, 1940-41.
SMITH, D. E. *History of Mathematics*, **1,** 97-98, Dover ed. 1958.
THIBAUT, G. 'On the śulba-sūtras', *JASB*, **44,** no. 3, 227-275, 1875.
VOGT, H. 'Der Pythagorische Lehrsatz in den ältesten Geometry der Inder', *SG*, section 84, **3,** 1906.
VOGT, H. 'Haben die alten Inder den Pythagorischen Lehrasatz und das Irrationale gekannt', *BM*, **3,** 6-23, 1907.
WINTERNITZ, M. *Geschichte der indischen Litteratur*, **3,** 176, Leipzig, 1922.
ZEUTHEN, H. G. 'Sur l'Arithmétique Géometrique des Grecs et des Indiens', *BM*, series 3, **5,** 97-112, 1904.
ZEUTHEN, H. G. 'Théorem de Pythagore origine de la géometrie scientifique', *CRCIP/11*, Génève, 1904.

Baudhāyana-śulbasūtra. see BAUDHĀYANA.

Baūdhāyana-śulbasūtravyākhyā. बौधायनशुल्बसूत्रव्याख्या
It is a commentary on the *Śulbasūtra* of Baudhāyana.

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Manuscript reference:
VVRI/VR. p. 75. *13*, 98 ff. Nāgarī.

Baudhāyana-śulbasūtravyākhyā. see DVĀRAKĀNĀTHA.

Bhūbhrama-rekhānirūpaṇa. see SUDHĀKARA DVIVEDIN.

Bhāgapañcāṅga. भागपञ्चाङ्ग
A set of mathematical tables used for computing the calendar from the lunar time.
Manuscript reference:
BM/CB. *473*, 4 ff.

BHAIRAVA of Piṭhāpura (c. 1886 A.D.)

Sūryasiddhānta-jyāgaṇita. सूर्यसिद्धान्तज्यागणित
Astronomical tables for finding out the positions of the five planets, *viz*, Mars, Mercury, Venus, Jupitar and Saturn in their movements through the signs of the Zodiac.
Manuscript reference:
MADRAS/D. xxiv, *13514*, 23 ff.

Bhaṅgīvibhaṅgīkaraṇa. see RAṄGANĀTHA s.o. Nṛsiṃha Daivajña.

BHĀNUJIT

Khecara bhūṣaṇa. खेचर भूषण
An astronomical work.
Manuscript reference:
GUJARAT. iv. p. 120, *39*, 16 ff.

BHARATA, s.o. Yaśodhara.

Rasālā. रसाला
An elementary treatise on astronomy.
Manuscript reference:
BORS/AB. iii, *299*, 10 ff. Maithili.

BHĀRGAVA

Nakṣatramālā. नक्षत्रमाला
An astronomical work.
Manuscript reference:
TANJORE/PPS. xvi, *11465*, 25 ff. Grantha.

Bhārgava-sūtra. see BHṚGU.

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BHĀSKARA 1. (c. 600 A.D.)

1. *Āryabhaṭīya-sūtrabhāṣya* or *Āryabhaṭīya-tantrabhāṣya.* आर्यभटीयसूत्रभाष्य, आर्यभटीयतन्त्रभाष्य

A commentary on the *Āryabhaṭīya* of Āryabhaṭa 1.

Manuscript reference:

IO/AK. ii. part i, *6265*, 134 ff. Grantha. 1840 A.D.
TRI/TG. v. p. 120, Malayaḷam.

2. *Laghubhāskarīya.* लघुभास्करीय

An abridged and simplified version of his own *Mahābhāskarīya* in 8 chs.

Manuscript reference:

MADRAS/D. xxiv, *13474*, 23 ff. Nāgarī.
TRI/KS. iii, *890c*, 34 ff. Malayalam, incomplete; iv, *940*, 10 ff. Malayalam; *941*, 17 ff. Malayalam; *946*, 64 ff. Malayalam.
TRI/TG. i. p. 166, Malayalam.

Commentators:

Parameśvara, Śaṅkaranārāyaṇa and Udayadivākara.

Printed text, translations etc.

The *Laghubhāskarīya* with the commentary *Vivaraṇa* of Śaṅkaranārāyaṇa. Trivendrum Sanskrit Series no. 162, Trivendrum. 1949.

Laghubhāskarīya, edited and translated into English by Kripa Sankar Shukla Lucknow Univ., 1963.

3. *Mahābhāskarīya* or *Bṛhat-bhāskarīya.* महाभास्करीय, बृहत्भास्करीय

An astronomical treatise dealing with the duration of day and night, the method of testing the accuracy of a given position of the planets, the mode of finding out the excess month in a year etc. It discusses the *grahakarma*, a subject which was practically neglected by Āryabhaṭa, and is the earliest work known to have systematically dealt with the *modus operandi* for determining the position of the planets, using the principles of arithmetical calculations enunciated by Āryabhaṭa 1 in the *gaṇitapāda* of his work. This work is divided into 8 chs. *viz.*, (i) Madhyamādhikāra, (ii) Deśāntaraṣkarma, (iii) Tripraśnādhikāra, (iv) Sphuṭavidhi, (v) Grahaṇādhyāya, (vi) Darśanasaṃkārādi, (vii) Yugabhaganādi, (viii) Tithyānayanādi.

Manuscript reference:

LU. *42.*
MADRAS/D. xxiv, *13467*, 75 ff. Nāgarī.

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PU. ii, *3739*, 8 ff. Tamil.
TRI/KS. iv, *902*, 26 ff. Grantha.
TRI/TG. i, p. 156. Malayalam.
VVRI/VB. *5859*, 32 ff. Malayalam.

Commentators:
Govindaśvāmī and Parameśvara.

Anonymous Commentary:
Maṭṭābhāskarīyavyākhyā.

Printed text, translations etc.
Mahābhāskarīya with the commentary *Karmadīpikā* by Parameśvara, edited by Balavantaraya Apte. Ananda-srama Sanskrit Series no. 126, Poona, 1945.
Mahābhāskarīya, edited with introduction and appendices by T. S. Kuppanna Sastri. Madras Government Oriental Series no. 130. Madras, 1957.
Mahābhāskarīya. Edited and translated into English by Kripa Sankar Shukla. Lucknow University, 1960.

Study:
Dutta, B. 'The two Bhāskaras', *IHQ*, **6**, 727-36, 1930.
Singh, A. N. 'Hindu Trigonometry', *PBMS*, ns. 1, 77-92, 1939.

BHĀSKARĀCĀRYA or BHĀSKARA II, s.o. Maheśvara, 1114 A.D.

1. *Bījagaṇita.* बीजगणित

Well known algebraical work consisting of the following chs: (i) Ghana-vivaraṇa, (ii) Śūnya-vivaraṇa, (iii) Varṇavivaraṇa, (iv) Karaṇī-vivaraṇa, (v) Kuṭṭaka-vivaraṇa, (vi) Varga-vivaraṇa, (vii) Ekavarṇasamīkaraṇa, (viii) Madhyamāharaṇa, (ix) Anekavarṇasamīkaraṇa, (x) Anekavarṇamadhyamāharaṇa, (xi) Bhāvita.

Manuscript reference:
ANUP. iv. p. 373, *498*, 63 ff.; *499*, 46 ff.
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BN/AC. i. *989*, 81 ff. Nāgarī. 1793 A.D.
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NU/VK. *1250*, 94 ff. Nāgarī, 1700 A.D.; *1251*, 40 ff. Nāgarī; *1252*, ff. 56+51. Nāgarī. 1807 A.D.
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VVRI/VB. p. 78, *2666*, 21 ff. Nāgarī; *2588*, 19 ff. incomplete.

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Commentators:

Kṛpārāma Miśra, Kṛṣṇa Daivajñā, Paramasukha, Rāmakṛṣṇa, Sūryadaivajña, Sūryadāsa.

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Bījāṅkura, Bījāṅkurodāharaṇa Bījagaṇitanaukā, Bījodāharaṇa.

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ascribed to Bhāskarācārya, this has been questioned by T. S. Kuppanna Sastri (see under *Study*).

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3. *Līlāvatī.* लीलावती

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Manuscript reference:

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AS/HS & PS. x. *6921*, 39 ff. Nāgarī.

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BIK/RM. *676*, 37 ff. Nāgarī.

BM/CB. *445*, 64 ff. 1824 A.D.; *446*, 48 ff. 17th. century.

BN/AC. i. *254(11)*, Bengali, 1840 A.D.

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BU/GD. i. *384*, 37 ff. Nāgarī.

BU/HV. *1448*, 35 ff. Nāgarī.

CENSUS. *4747*, 12 ff. Nāgarī; *4748*, 6 ff. Nāgarī. incomplete; *4749*, 35 ff. Nāgarī; *4750*, 46 ff. Nāgarī. 1698 A.D.; *4751*,

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ff. 36-59. Nāgarī; *4752*, 54 ff. Nāgarī. 1885 A.D.; *4753*, ff. 1-8, 11-32. Nāgarī. 1717 A.D.; *4754*, ff 1-38. Nāgarī; *4755*, 47 ff. Nāgarī. 1891 A.D.; *4756*, 14 ff, Nāgarī; *4757*, 6 ff, Nāgarī. incomplete. *4758*, ff. 7-40. Nāgarī. incomplete; *4759*, 88 ff. Malayalam; *4760*, ff. 1-133, ff. 1-97. Nāgarī.

CP/FK. p. 240, *143*, 24 ff.

CSC/HS & SG. ix, *125*, 14 ff. Nāgarī. incomplete; *126*, 55 ff. Nagarī; *127*, 16 ff. Nāgarī.

F&M/TA. p. 84, *259*, 37 ff. 1837 A.D.

GUJARAT. iv. p. 154, *229*, 28 ff. 1648 A.D.

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M & C/LR. *353*, Kanarese; *354*, Nāgarī; *355*, Nāgarī; *356*, Nāgarī.

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MYSORE/AM. p. 51, *44*, 59 ff. Kanarese.

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OUDH (1890). p. 136, *146*, 10 ff. Nāgarī.

PU. ii, *3891*, 37 ff. 1842 A.D.; *3892*, 36 ff. 1853 A.D.; *3893*, 60 ff. Tamil; *3894*, 33 ff. Tamil; *3895*, 8 ff. incomplete; *3896*, ff. 2-33. incomplete; *3897*, ff. 12-29. incomplete; *3898*, 4 ff. incomplete; *3899*, 5 ff. 1834 A.D. incomplete; *3900*, 5 ff. incomplete; *3901*, ff. 6-25, incomplete; *3902*, 8 ff. incomplete; *3903*, 21 ff. incomplete; *3904*, 2 ff. incomplete; *3905*, ff. 2-23. incomplete.

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UJJAIN. p. 52, *2375*, 83 ff. incomplete.
VVRI/VB. p. 79. *1616*, 26 ff. Nāgarī, incomplete; p. 80, *2374*, 31 ff. Nāgarī, incomplete; *2434*, 49 ff. Nāgarī. 1792 A.D.; *2599*, 29 ff. Nāgarī, incomplete; *2597*, 48 ff. Nāgarī, incomplete; *4522*, 92 ff. Nāgarī, 1870 A.D.; *2598*, 23 ff. Nāgarī, 1755 A.D. incomplete.

Commentators:

Ahoṣakadeva, Candraśekhara Paṭanāyaka, Dāmodara, Devīsahāya, Dhaneśvara, Gaṇeśa Daivajña, Gaṅgādhara, Kāma, Keśava, Mādhava, Mahīdāsa, Mahīdhara, Moṣadeva, Nārāyaṇa, Nīlāmbara Jhā, Parameśvara, Paraśurāma, Rāmacandra, Rāmadatta, Rāmakṛṣṇa, Rāmakṛṣṇa Deva, Rāmeśvara Miśra, Raṅganātha, Śrīdharācārya, Srīdhara Mahāpātra, Śrīkṛṣṇa, Sūryadāsa, Sūryamaṇi, Vīreśvara, Viśveśvara, Vṛndāvana.

Anonymous Commentaries:

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4. *Siddhāntaśiromaṇi*. सिद्धान्तशिरोमणि 1150 A.D.

A well-known and widely used astronomical work divided into two parts: (a) Gaṇitādhyāya or Grahagaṇita, and (b) Golādhyāya or Grahagola. The first part has the following chs:—(i) Madhyamādhikāra, (ii) Spaṣṭādhikāra, (iii) Tripraśnādhikāra, (iv) Parvasambhavādhikāra, (v) Candragrahaṇādhikāra, (vi) Sūryagrahaṇādhikāra, (vii) Grahacchāyādhikāra, (viii) Grahodayāstādhikāra, (ix) Śṛṅgonntyadhikāra, (x) Grahayutyadhikāra, (xi) Bhagrahayutyadhikāra, (xii) Pātādhikāra. The second part *Golādhyāya* is divided into the following 14 chs: (i) Golapraśaṃsā, (ii) Golasvarūpapraśnādhyāya, (iii) Bhūvanakośa, (iv) Madhyagativāsanā, (v) Sphuṭagativāsanā, (vi) Golabandhādhikāra, (vii) Tripraśnavāsanā, (viii) Grahaṇavāsanā, (ix) Dṛkkarma vāsanā, (x) Śṛṅgonnativāsanā, (xi) Yantrādhyāya, (xii) Ṛtuvarṇana, (xiii) Praśnādhyāya, and (xiv) Yyotpatti. Each part has also been treated as a separate work, and considering the large number of Mss described and catalogued as *Siddhāntaśiromaṇi*, *Gaṇitādhyāya* and *Golādhyāya*, as will be evident from what follows, the whole work and the two parts have been shown separately under manuscript reference. This separation, however, has not been maintained under subsequent sections, e. g., printed texts and translations, studies etc. In the descriptive catalogues consulted, the *Siddhāntaśiromaṇi* with the author's own commentary *Vāsanābhāṣya* has in some been shown under *Siddhāntaśiromaṇi* and in others under *Vāsanābhāṣya*. Accordingly, the Mss. noted under *Vāsanābhāṣya* contain both the original text and the author's own commentary whereas those noted under *Siddhāntaśiromaṇi* may or may not contain the commentary. The same remark is applicable to the two parts, *Gaṇitādhyāya* and *Golādhyāya*.

Manuscript reference:

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BORS/AB. iii, *410*, 111 ff. Maithili. 1849 A.D.
BN/AC. i, *958(iii)*, Bengali, 1840 A.D.; *994*, 115 ff. Nāgarī. 1815 A.D.

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CENSUS. p. 235, *4737*, ff. 57-70, 72-118; *4738*, 9 ff.; *4739*, another copy; *4740*, 26 ff.
CP/FK. p. 242, *159*, 400 ff. 1834 A.D.
CSC/HS & SG. p. 161, *168*, 51 ff. Nāgarī, contains up to Yantrādhyāya.
GUJARAT. iv. p. 208, *520*, 26 ff. 1608 A.D.; *523*, 75 ff. 1714 A.D.
IO/JE. v. *2834*, 96 ff. Nāgarī, 1688 A.D., *Gaṇitādhyāya* & *Golādhyāya; 2835*, 64 ff. Bengali, *Gaṇitādhyāya* & *Golādhyāya; 2836*, 54 ff. Nāgarī, the last two chps. of the *Siddhānta-śiromaṇi; 2842*, ff. 130+75, Nāgarī, 1790 A.D., *Gaṇitādhyāya* and *Golādhyāya; 2843*, another copy.
MAC/HW. p. 163, *8a*, Nāgarī, last 10 chs; *8b*, Telugu.
NU/VK. p. 511, *2470-2478* (except *2477*), 8 copies, Nāgarī.
OUDH. i. p. 16, *51*, 130 ff. Nāgarī; p. 128, *112*, 400 ff. Nāgarī.
PU. ii, *4054*, 43 ff. Nāgarī; *4052*, ff. 3-13, Nāgarī.
RAS/BB/VM. p. xxix. 312 ff.
RORI/JM. ii. *5291*, 33 ff. 1828 A.D.; *5292*, 30 ff. 18th. century; *5337*, 55 ff. 1877 A.D.
RS/CW. *28*, Nāgarī.
RTL/KS. p. 175, 27 ff.; p. 176, 135 ff, Kāsmīri, complete.
TANJORE/PPS. xvi, 7740, *11649*, 91 ff. Nāgarī.
UDAIPUR. p. 172, *1804*.
VVRI/VB. *2370*, 102 ff. Nāgarī; *2631*, 14 ff. Nāgarī.

(b) *Gaṇitādhyāya*.

CENSUS. *4743*, 42 ff. Nāgarī, 1825 A.D.; *4744*, 36 ff. 1621 A.D.
IO/JE. v, *2837*, 27 ff. Bengali; *2844*, 231 ff. Nāgarī; *2845*, 118 ff. Nāgarī, 1790 A.D.; *2846*, 60 ff. Nāgarī.
LEIPZIG/TA. *965*, 27 ff. c. 1690 A.D.
MADRAS/T. i. part i. Sanskrit A, *313*, 38 ff. Telugu.
PU. ii, *4050*, 25 ff. 1842 A.D.
RAS/BB/HV. *280*, 9 ff. Nāgarī; *281*, 14 ff. Nāgarī.
RTL/MS. p. 157, 45 ff.
VVRI/VB. *4575*, 20 ff. Nāgarī, 1862 A.D.

(c) *Golādhyāya*.

BN/AC. i, *958(ii)*, Bengali, 1840 A.D.; *959*, Nāgarī. 18th. century.
BORS/AB. iii. *46*, 103 ff. Maithili, 1870 A.D.
BU/GD. i. *386*, 63 ff. Nāgarī.
BU/HV. *1450*, 63 ff. Nāgarī.
CENSUS. *4745*, 14 ff. Nāgarī, incomplete; *4746*, 115 ff. 1835 A.D.
CSC/HS & SG. ix. *15*, 75 ff. Nāgarī.
GUJARAT. iv. p. 124, 34 ff.
IO/JE. v. *2847*, 98 ff. Nāgarī, 1660 A.D.; *2848*, 86 ff. Nāgarī, 1800 A.D.; *2849*, 59 ff. Nāgarī; *2850*, 75 ff. Nāgarī, 1790 A.D.
LU. *46*.
M&C/LR. *277*, Nāgarī.

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MYSORE/AM. p. 51, *A26, 338*, Kanarese.
NU/VK. p. 511, *2477*, Nāgarī.

Commentators:

Bhāskara, Cakracūḍāmaṇi, Dhaneśvara, Gaṇeśa, Hariḥāra, Jayalakṣmaṇa, Lakṣmīdāsa, Lakṣmīnātha, Maheśvaropādhyāya, Mohanadāsa, Munīśvara, Nṛsiṃha, Rājagiri Pravāsī, Rāmakṛṣṇa, Raṅganātha, Vācaspati Miśra Viśvanātha Daivajña.

Anonymous Commentaries:

Siddhānta-śiromaṇiṭīkā, Siddhānta-śiromaṇyudāharaṇa, Siddhānta-śiromaṇi-vyākhyā, Vāsanābhāṣya.

Printed text, translations etc.

Siddhānta Śiromaṇiprakāśa with Mārāṭhī translation, Bombay, 1837.

Siddhānta-śiromaṇi with commentary *Siddhānta-śiromaṇiprakāśa* by Rāmacandra, Madras, 1837.

Gaṇitādhyāya and *Golādhyāya* with the *Vāsanābhāṣya*, published by L. Wilkinson, Calcutta, 1842.

Siddhānta-śiromaṇi by L. Wilkinson, revised by Pandit Bāpūdeva Śāstrī, Calcutta, 1861.

Gaṇitādhyāya and *Golādhyāya*, edited by Bāpūdeva Śāstrī, Benares, 1866.

Siddhānta-śiromaṇeḥ Golādhyāyaḥ with *Vāsanābhāṣya*, edited by Jīvānanda Bhattācārya, Calcutta, 1880.

Siddāntaśiromaṇi Gaṇitādhyāya or *Grahagaṇita* with a gloss called *Mitākṣarā* by Raṅganātha. Ed. by Jīvānanda Bhattācārya, Calcutta, 1881.

Phalitajyotiṣa pt. III. containing *Golādhyāya* with *Vāsanābhāṣya* and Bengali translation. Ed. by Rasikamohan Chattopādhyāya, Calcutta, 1887.

Bṛhaspati. 1, Calcutta, 1896-97.

Gaṇitādhyāya of *Siddhāntaśiromaṇi* with *Vāsanābhāṣya, Vāsanāvārtika*, and *Marīci*. *PANDIT*, ns, 30 & 31, Benares, 1908-9.

Golādhyāya. Edited with Mārāthī translation by Vināyaka Pāṇduraṅga Khanapurkar. Bombay, 1911.

Siddhāntaśiromaṇeḥ Gaṇitagolādhyāyayoḥ ṭippaṇīvivaraṇa by Buddhinātha Jhā. Benaras, 1912.

Gaṇitādhyāya. Ed. with Mārāthī translation and exposition, styled *Sopapattikabhāṣāntara* by Vināyaka Pāṇduranga Khanapurkar. Poona, 1913.

Siddhāntaśiromaṇeḥ Grahagaṇitasya Madhyamādhikārāntaḥ. Ed. with the *Vāsanābhāṣya* of the author, *Vāsanāvārtika* of Nṛsiṃha and *Marīci* of Viśvarūpa by Muralīdhara Jhā. Benares, 1917.

Siddhāntaśiromaṇeḥ Golādhyāyaḥ with *Vāsanābhāṣya.* Ed. with Bengali translation and expository notes by Rādhāgovinda Smṛti-vyākaraṇa Jyotiṣa-tīrtha. Calcutta, 1921.

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Siddhāntaśiromaṇi. A treatise on astronomy with author's exposition, the *Vāsanābhāṣya*. Edited by Bāpūdeva Śāstrī. Revised by Gaṇapati Deva Śāstrī. Kāsī Sanskrit Series no. 72. Benares, 1929.

Siddhāntaśiromaṇi with *Utpattīndursaptarā*, a commentary on the *Siddhāntaśiromaṇi* of Bhāskarācārya with extracts from the ancient Siddhāntas, the explanations of Bāpūdeva Śāstrī's annotations and an elaborate critical introduction etc. edited by Pandit Girijāprasad Dvivedi. Ahmedabad, 1936.

Golādhyāya with *Vāsanābhāṣya*. Ed. with *Prabhā-bhāṣābhāṣya-upapatti* and numerous explanatory notes by Pandit Girijāprasad Dvivedi. Lucknow.

Grahagaṇitādhyāya with commentary *Vāsanābhāṣya*. Ed. by V. Dattātreya Āpte. Ānandāśrama Sanskrit Series no. 110. Poona, 1939.

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Study:

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CHATTERJEE, BINA. 'Geometrical interpretation of the motion of the sun, moon and the five planets as found in the mathematical syntaxis of Ptolemy and in the Hindu astronomical works'. *JASB*, **15,** 47-87, 1949.

COLEBROOKE, H. T. 'On the Indian and Arabian division of the zodiac'. *AR*, **9,** 323-376, 1807.

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FLEET, J. F. 'Some Hindu values of the dimensions of the earth'. *JRAS*, 463-70, 1912.

FLEET, J. F. 'Tables for finding the mean place of Saturn'. *JRAS*, 741, 1915.

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SARTON, GEORGE. *Introduction to the History of Science*. **2**, part i, 8, 10, 28, 127, 128, 145, 212-214, 297; part ii, 625, Baltimore, Reprint, 1950.
SASTRI, BAPUDEVA. 'Bhāskara's knowledge of the differential calculus'. *JASB*, **27**, no. 3, 213-216, 1858.
SENGUPTA, P. C. 'Hindu luni-solar astronomy'. *BCMS*, **24**, 1-18, 1932.
SINGH, A. N. 'Hindu trigonometry'. *PBMS*, no. 1, 77-92, 1939.
SPOTTISWOODE, W. 'Note on the supposed discovery of the principle of the differential calculus by an Indian astronomer'. *JASGBI*, **17**, 221-22, 1860.
SMITH, D. E. *History of Mathematics*. **1**, 280-282; **2**, 615, Dover edition, 1958.
SUTER, H. G. 'Eine Indische Methode der Berechnung der Kügelöber flache'. *BM*, Series 3, **9**, 196-99, 1908-9.
WINTERNITZ, M. *Geschichte der Indischen Litteratur*. **3**, 564, Leipzig, 1922.

5. *Karaṇakutūhala* or *Grahāgamakutūhala* or *Brahmatulya* or *Brahmasiddhāntatulya* or *Brahmatulyasiddhānta*. करणकुतूहल, ग्रहागमकुतूहल, ब्रह्मतुल्य, ब्रह्मसिद्धान्ततुल्य, ब्रह्मतुल्यसिद्धान्त 1183 A.D.

A treatise on planetary motions.

Manuscript reference:

ANUP. p. 343; *59*, 11 ff.; *60*, 6 ff.; 1589 A.D.; *61*, 6 ff.; *62*, 19 ff.; *63*, 19 ff.; p. 374, *25*, 13 ff.
AS/HS & PS. x, *6835*, 13 ff. Nāgarī. 1689 A.D.; *6836*, 22 ff. Nāgarī, 1733 A.D.; *6837*, 16 ff. Nāgarī; *6838*, ff. 22-65, Nāgarī, 1664 A.D.
BERLIN. i. *844*, 11 ff. 1624 A.D.
BIK/RM. *667*, 11 ff. Nāgarī.
BN/AC. i. *1005*(*vi*), Nāgarī, 18th. century; *1005*(*vii*), Nāgarī.
BODLEIAN. *774*.
BORS/AB. iii, *20*, 12 ff. Maithili, 1857 A.D.
CENSUS. *4727*, 22 ff. Nāgarī; *4728*, 16 ff. Nāgarī; *4729*, 6 ff. Nāgarī; *4730*, 17 ff. Nāgarī.
CP/FK. p. 225, *5*, 16 ff. 18th. century; p. 234, *98*, 13 ff.
FSM/TA. p. 84, *260*, 11 ff. 18th. century.
GUJARAT. iv. p. 128, *85*, 12 ff. 1621 A.D.; p. 166, *294*, 10 ff. 1521 A.D.
IO/AB. ii. part i, *8051*, 4 ff. Nāgarī, 18th. century.
IO/JE. v, *2925*, 8 ff. Nāgarī, 1708 A.D.; *2926*, 12 ff. Bengali; *2927*, 72 ff. Nāgarī, 1510 A.D.; *2928*, 75 ff. Nāgarī, 1817 A.D.; *2929*, 35 ff. Nāgarī, 1673 A.D.

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LEIPZIG/TA. *968*, 26 ff. 1676 A.D.
NU/VK. *1306*, 19 ff. Nāgarī, 1814 A.D.
PU. ii, *3720*, 33 ff.; *3721*, 14 ff.; *3722*, 5 ff.; *3723*, 6 ff.; *3724*, 73 ff.; *3725*, 52 ff.
RAS/BB/HV. *216*, 14 ff. Nāgarī, 1851 A.D.; also see *217-19*.
RAS/BB/VM. p. xiv. incomplete.
RORI/JM. ii, *4690*, 21 ff., 1850 A.D.; *4873*, 11 ff. 1778 A.D.; *4884*, 22 ff. 1702 A.D.; *5705*, 19 ff. 19th. century; *6435*, 16 ff. 1844 A.D.
RTL/MS. p. 256, 8 ff.
TCC/TA. p. 15, *44*.
UDAIPUR. p. 18, *551*, 1641 A.D.; *552*, 1660 A.D.
VVRI/VB. *1541*, 8 ff. Nāgarī, 1705 A.D.; *2969*, 57 ff. Malayalam; *2606*, 16 ff. Nāgarī; *2659*, 18 ff. Nāgarī, 1705 A.D.

Commentators:

Caṇḍīdāsa, Ekanātha, Harṣagaṇi, Keśavārka, Padmanābha, Viśvanātha.

Anonymous commentaries:

Karaṇakutūhalabhāṣya, *Karaṇakutūhalaṭippaṇa*, *Karaṇakutūhala-vṛtti*, *Karaṇakutūhala-vyākhyā*.

Printed text, translations etc.

Karaṇakutūhala edited with commentary *Vāsanā* by Sudhākara Dvivedin, Benaras, 1881.
Karaṇakutūhala with the commentary of Sumatiharṣa. Bombay, 1901.

Study:

WINTERNITZ, M. *Geschichte der Indischen Litteratur*, **3**, 565, Leipzig, 1922.

6. *Siddhāntaśiromaṇiṭīka* or *Mitākṣarā* or *Vāsanābhāṣya*.
सिद्धान्तशिरोमणिटीका, मिताक्षरा, वासनाभाष्य

Author's own commentary on his *Siddhāntaśiromaṇi*, the famous astronomical work.

Manuscript reference:

ANUP. iv, p. 400, *14*, 167 ff.; *15*, 145 ff.; v, p. 401, *16*, 110 ff.
AS/KBK. p. 173, Nāgarī; p. 225, Nāgarī, three copies.
BANARAS. p. 259, *100*, 121 ff., Golādhyāyavāsanābhāṣya; *101*, 192 ff. Gaṇitādhyāya-vāsanābhāṣya.
BM/CB. *450*, 64 ff. Nāgarī, 19th. century.
CENSUS. p. 233, *4342*, ff. 5-56.
CSC/HS&SG. ix, p. 167, *174*, 131 ff. Nāgarī, 1663 A.D.
FSM/TA. p. 83, *258*, 143 ff. 1790 A.D.
IO/JE. v, *2838*, ff. 124+85+33, Nāgarī, c. 1750 A.D.; *2839*, ff. 23+81+56, Nāgarī; *2840*, ff. 67+136, Nāgarī, c. 1799; A.D., *2841*, ff. 60+1, Nāgarī, c. 1799 A.D.

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MADRAS/D. xxiv, *13505*, 375 ff. Telugu.
NWP. v, p. 88, 89 ff. Nāgarī.
OUDH (1890), i, p. 128, *111*, 384 ff. Nāgarī; xii, p. 22, *3*, 270 ff. Nāgarī; i, p. 112, *44*, 534 ff. Nāgarī.
PU. ii, *4053*, 50 ff. Nāgarī, 1370 A.D., upto Golādhyāya; *4054*, 52 ff. Nāgarī, upto Pātādhyāya; *4055*, 35 ff. Nāgarī.
RORI/JM. ii, *5787*, 176 ff. 1882 A.D.; *5629*, 81 ff. 19th. century; *2630*, 50 ff. 19th. centrury.
TANJORE/PPS. xvi, *11654*, 68 ff. Nāgarī.
VVRI/VB. *2587*, 16 ff. Nāgarī, 1847 A.D.; *2666*, 50 ff. Nāgarī; *5484*, 6 ff. Nāgarī.

Printed text, translations etc.
See under *Siddhāntaśiromaṇi*.

Bhāsvatī. see SATĀNANDA.

Bhāsvatīdyota. भास्वतीद्योत
An anonymous commentary on the *Bhāsvatī* of Śatānanda.

Manuscript reference:
VVRI/VB. *2630*, 15 ff. Nāgarī.

Bhāsvatīkaraṇa. see SATĀNANDA.

Bhāsvatīkaraṇaṭīkā. भास्वतीकरणटीका
An anonymous commentary on the *Bhāsvatī* of Śatānanda.

Manuscript reference:
BU/GD. i, *374*, 11 ff. Nāgarī.
GUJARAT. iv, p. 170, *310*, 18 ff.
IO/JE. v, *2919(iii)*, ff. 52a-65a.
NWP. i, p. 546, *112*, 5 ff. Nāgarī.
TCC/TA. p. 50, 10 ff. Bengali, beginning of 18th century.
VVRI/VB. *2357*, 26 ff. Nāgarī; *2594*, 51 ff. Nāgarī.

Bhāsvatīprakāśikā. see GOPĪNĀTHA SUDHĪ.

Bhāsvatī-ṭīkā. see BHAṬṬOTPALA.

Bhāsvatī-ṭīkā. see CAKRAVIPRADĀSA.

Bhāsvatī-ṭīkā. see MĀDHAVA.

Bhāsvatīkārtha-ratnamālikā. see ACYUTA BHAṬṬA.

Bhāsvatī-ratnadīpikā. see ACYUTA BHAṬṬA.

Bhāsvatī-ratnamālā. see ACYUTA BHAṬṬA.

Bhāsvatī-udāharaṇa. see VIŚVANĀTHA.

Bhāsvatī-vivṛti. see GAṆAPATI BHAṬṬA.

Bhāsvatī-vyākhyā. see GOVINDA MIŚRA.

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Bhāsvatī-vyākhyā. see KUBERA MIŚRA.

Bhāsvatī-vyākhyā. see VANAMĀLĪ.

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Bhāsvatyudāharaṇa. भास्वत्युदाहरण

An anonymous commentary on the *Bhāsvatī* of Śatānanda.

Manuscript reference:

BORS/AB. iii, *239A*, 6 ff. Maithili, 1801 A.D.
CENSUS. p. 238, *4784*, 10 ff. Nāgarī.

Bhāsvatyudāharaṇa. see GAṄGĀDHARA.

Bhāsvatyudāharaṇa. see KAMALANAYANA.

Bhāsvatyudāharaṇa. see KEŚAVA.

Bhāsvatyudāharaṇa. see VṚNDĀVANA ŚUKLA.

Bhāsvatyudāharaṇa. see YOGĪNDRA.

Bhaṭadīpikā. see PARAMEŚVARA.

Bhaṭaprakāśa. see SŪRYADEVA YAJVAN.

BHAṬṬOJI DĪKṢITA, s.o Lakṣmīdhara (earlier than 1641 A.D.)

Tithinirṇaya. तिथिनिर्णय

An astronomical work for the determination of *tithis*.

Manuscript reference:

CENSUS, *3101*, 29 ff. *3102*, 32 ff. 1753 A.D.
NEPAL/HS. ii, p. 189, *III. 319A*, Nāgarī.

BHAṬṬOTPALA. (966 A.D.).

Bṛhatsaṃhitāvivṛti. बृहत्संहितावृत्ति

It is a commentary on the *Bṛhatsaṃhitā* of Varāhamihira.

Manuscript reference:

AS/KBK. p. 118, Nāgarī.

Printed text, translations etc.

Bṛhatsaṃhitā with the commentary of Bhaṭṭotpala. Ed. by Sudhākara Dvivedi, 2 vols. Vizianagram Sans. Series no. 10. Benares, 1895-97.

BHAṬṬOTPALA (later than 1099 A.D.)

Bhāsvatī-ṭīkā. भास्वतीटीका

A commentary on the *Bhāsvatī* of Śatānanda.

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Manuscript reference:
NWP. ii, p. 155, 5 ff.

Study:
DAS, SUKUMAR RANJAN. 'Motion of the earth as conceived by the ancient Indian astronomers'. *BCMS*, **17**, 173-82, 1926.

Bhaumasāriṇī. भौमसारिणी
An anonymous astronomical work giving tables of motions of Mars.

Manuscript reference:
PU. ii, *3761*, 31 ff. Nāgarī.

Bhāva-nighaṇṭu. भावनिघण्टु
An anonymous astronomical work.

Manuscript reference:
MADRAS/D. xxiv, *13853-13871.*
MADRAS/T. ii, part i, Sanskrit A, *128(b)*, ff. 2a-2b, Telugu, 1913-14 A.D.; iii, part i, Sanskrit B, *2533(a)*, 79 ff. Telugu.

BHAVĀNĪŚAṄKARA

Yantracintāmaṇi. यन्त्रचिन्तामणि
An astronomical work on the method of finding time by means of a quadrant.

Manuscript reference:
NWP. i, p. 526, *60*, 9 ff. Nāgarī.

Bhāvaprakāśa. भावप्रकाश
An anonymous commentary on the *Āryabhaṭīya* of Āryabhaṭa 1.

Manuscript reference:
MADRAS/T. iv, part i, Sanskrit C, *4875*, 93 ff. Grantha.

BHṚGU

Bhārgava-sūtra. भार्गवसूत्र

Manuscript reference:
OPPERT. i, *1294.*

Bhūbhramaṇa. see SUDHĀKARA DVIVEDIN.

Bhūbhramavāda-khaṇḍananirāsa. see SĪHORA.

BHŪDHARA SŪRI, s.o. Devadatta, grandson of Keśavārya and a native of Kāmpilya on the banks of the Ganges (c. 1572 A.D.)

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Sūrya-siddhānta-vivaraṇa. सूर्यसिद्धान्तविवरण 1572 A.D.

A commentary on the *Sūryasiddhānta.*

Manuscript reference:

AS/HS & PS. x, *6942*, 221 ff. Nāgarī.
AS/KBK. p. 227, Bengali.
BN/AC. i, *973(iv)*, Bengali, 1840 A.D.
BODLEIAN, *773*, 184 ff.
BÛ/GD. i, *393*, 74 ff. Nāgarī.
CSC/HS & SG. ix, *180*, 167 ff. Bengali.
IO/JE. v, *2782*, 206 ff. Nāgarī, 1792 A.D.; *2783*, Nāgarī.
LU. *66.*
MADRAS/T. vol. i, part i, Sanskrit B, *363*, 212 ff. Nāgarī, 1911-12 A.D.
NOTICES/RM. v, *1817*, 222 ff. Nāgarī.
OUDH. p. 112, *43*, 166 ff. Nāgarī.
PU. ii, *4076*, 149 ff. Nāgarī.
RTL/MS. p. 177, 165 ff.
UJJAIN. p. 56, *2301*, 139 ff. 1830 A.D.
VVRI/VB. *2629*, 29 ff. Nāgarī; *4917*, 88 ff. Nāgarī.

Bhūgola. भगोल

An anonymous work dealing with the description of the universe as found in the *Brahmāṇḍa purāṇa.*

Manuscript reference:

BM/CB. *469*, 6 ff. Nāgarī, 19th. century.
MADRAS/D. xxiv, *13464*, 5 ff.; Supplemental, xxv, *14347*, 7 ff. Telugu.
RAS/BB/HV. *253*, 5 ff. Nāgarī, 1753 A.D.

Bhūgolanirṇayasavyākhyāna. see VEDĀNTA DEŚIKA.

Bhūgolasāra. see OṂKĀRA BHAṬṬA.

Bhūgola-vicāra. see NĪLAKAṆṬHA.

Bhūgolavistāra. भूगोलविस्तार

An anonymous work.

Manuscript reference:

TANJORE/AB. p. 76, 8 ff. Nāgarī.

Bhuktāṃśa-sāriṇī. भुक्तांशसारिणी

An anonymous work.

Manuscript reference:

VVRI/VB. p. 79, *787*, 7 ff. Nāgarī.

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Bhūpati (c. 1613 A.D.)
Gaṇitāmṛta. 1613 A.D.
Manuscript reference:
ANUP. iv, p. 346, *8*, 18 ff.
GUJARAT. iv, p. 124, *56*, 8 ff.

BHŪTAVIṢṆU
Daśagītisūtra-vyākhyā. दशगीतिसूत्रव्याख्या
A commentary on the *Daśagīti-sūtra*, the first chapter of the *Āryabhaṭiya* of Āryabhaṭa 1.
Manuscript reference:
CENSUS. *4670*, 9 ff.

Bhūvanadīpaka. see NĀRACANDRA.

Bhūvanadīpaka. see PADMANĀBHA.

Bhūvanadīpaka-ṭīkā. see SIṂHATILAKA SŪRI.

Bhūvanadīpikā-ṭīkā. see VIGHNARĀJA.

Bījagaṇita. see BHĀSKARĀCĀRYA.

Bījagaṇita. बीजगणित
An anonymous work.
Manuscript reference:
UDAIPUR. p. 88, *1428*.
VSP/CC. p. 164, *1193*, ff. 1-24, Nāgarī.

Bījagaṇitanaukā. बीजगणितनौका
An anonymous commentary on the *Bījagaṇita* of Bhāskarācārya.
Manuscript reference:
PU. ii, *3687*, 78 ff. Nāgarī, 1829 A.D.

Bījagaṇitaṭīkā. see SŪRYA DAIVAJÑA.

Bījagaṇita-vivṛti. see KṚPĀRĀMA MIŚRA, s.o. Lakṣmīṇārāyaṇa.

Bījagaṇita-vyākhyā. see KṚPĀRĀMA MIŚRA, s.o. Laksmīnārāyaṇa.

Bījagaṇitavyākhyā. see SŪRYA GAṆAKA.

Bījagaṇitamavyaktagaṇitam vā. see SUDHĀKARA DVIVEDIN.

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Bījanavāṅkura. see KṚṢṆA DAIVAJÑA, s.o. Ballāla.

Bījāṅkura. see KṚṢṆA GAṆAKA.

Bījāṅkura. बीजाङ्कुर

An anonymous commentary on *Bījagaṇita* of Bhāskarācārya.

Manuscript reference:

BIK/RM. *755*, Nāgarī.
OUDH. i, p. 14, *25*, 260 ff. Nāgarī.

Bījāṅkurodāharaṇa. बीजाङ्कुरोदाहरण

An anonymous commentary on the *Bījagaṇita of* Bhāskarācārya.

Manuscript reference:

OUDH. i, p. 14, *24*, 82 ff. Nāgarī.

Bījapallava. see KṚṢṆA DAIVAJÑA, s.o., Ballala.

Bījapāṭī. बीजपाटी

An anonymous commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

GUJARAT. iv, p. 154, *232*, 46 ff. 1766 A.D.

Bījaprabodha. see RĀMAKṚṢṆA, s.o. Lakṣmaṇa.

Bījavāsanābhāṣya. बीजवासनाभाष्य (1687 A.D.)

An anonymous work.

Manuscript reference:

RORI/JM. ii, *6212*, 154 ff. 1854 A.D.

Bījavivṛtikalpalatā. see PARAMASUKHA, s.o. Sītārāma.

Bījavivṛtikalpalatāvatāra. see KṚṢṆA DAIVAJÑA, s.o. Ballāla.

Bījodāharaṇa. बीजोदाहरण

An anonymous commentary on the *Bījagaṇita* of Bhāskarācārya.

Manuscript reference:

BIK/RM. *756*, 143 ff. Nāgarī.
BORS/AB. *218*, 60 ff. Maithili.
CSC/HS & SG. ix, *70*, 136 ff.
RTL/MS. p. 167, 79 ff.

Bījodāharaṇa. see KṚPĀRĀMA MIŚRA, s.o. Lakṣmī-nārāyaṇa.

Bījopanaya. see BHĀSKARĀCĀRYA.

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BILHANA.

Karmaratnāvalī. कर्मरत्नावली

Manuscript reference:

GUJARAT. iv. p. 116, *21*, 21 ff.

BRAHMADEVA GAṆAKA, s.o. Śrīcandra alias Candradeva of Mathurā (c. 1092 A.D.)

Karaṇaprakāśa. करणप्रकाश 1092 A.D.

An astronomical work describing the method of calculating the positions of the places from *ahargaṇanā* following the work of Āryabhaṭa I with the corrections suggested by Lalla. It contains the following 10 chs. (a/c. IO/JE), viz., (i) (Graha) madhyādhikāra, (ii) Tithyadhikāra (iii) Pañcatārāspaṣṭīkaraṇādhikāra, (iv) Tripraśnādhikāra, (v) Candragrahaṇaparilekhanādhikāra, (vi) Sūryagrahaṇādhikāra, (vii) Grahodayāstādhikāra, (viii) Śṛṅgonnatyadhikāra, (ix) Grahayutyadhikāra and (x) Granthālaṅkaraṇādhikāra. The xth ch. consists of two verses, which give the time and parentage of the author. The ch. headings are not the same in all Mss. e.g. MADRAS/D mentions 9 chs. This is a very popular Karaṇa-work.

Manuscript reference:

ANUP. iv, 343, *64*, 15 ff.
BANARAS. p. 261, *65*, ff. 1-6.
BU/GD. i, *338*, 11 ff. Nāgarī, 1792 A.D.
CP/FK. p. 224, *6*, 12 ff.
GUJARAT. iv, p. 110, *19*, 11 ff. 1561 A.D.
IO/JE. v, *2913*, 14 ff. Nāgarī, 1752 A.D.
KANNADA. *215*, 17 ff. Kanarese.
LU. *74*.
MADRAS/D. xxiv, *13398*, 80 ff. Telugu, 1864 A.D.; *13399*, 116 ff. Kanarese with a Kanarese commentary (5 chs. only).
PU. ii, 3282, 4 ff. Nāgarī, 1848 A.D.; *3283*, 6 ff. Nāgarī; *3543*, 4 ff. Nāgarī, 1848 A.D. contains Tithyadhikāra under title Tithyādisādhanā.
RAS/BB/HV. *223*, 6 ff. Nāgarī.
RTL/MS. p. 256, 10 ff.
VVRI/VB. *1824*, 14 ff. Nāgarī, 1880 A.D. incomplete.

Commentators:

Amareśa, Dāmodara, Govinda, and Śrīnivāsa.

Printed text, translations etc.

Karaṇa-prakāśa. Edited with commentary and theory of numbers by Sudhākara Dvivedin. Chowkhamba Sanskrit Series no. 5, Benares, 1899 A.D.

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BRAHMAGUPTA, s.o. Jiṣṇu. (c. 628 A.D.)

1. *Brahmasphuṭasiddhānta* or *Brahmasiddhānta.* ब्रह्मस्फुट-सिद्धान्त, ब्रह्मसिद्धान्त 628 A.D.

An astronomical-mathematical work divided into 24 chs., *viz.*, (i) Madhyamādhikāra, (ii) Sphuṭīkaraṇādhikāra, (iii) Tripraśnādhyāya, (iv) Candragrahaṇādhyāya (v) Ravigrahaṇādhikāra, (vi) Uḍayāstamayādhyāya, (vii) Śṛṅgonnaṭyadhyāya, (viii) Candracchāyādhyāya, (ix) Grahamelayodhyāya, (x) Bhagrahayutyadhikāra, (xi) Dūṣaṇādhyāya, (xii) Saṅkalitādhyāya, (xiii) Madhyagativāsanādhyāya, (xiv) Sphuṭagatyadhyāya, (xv) Tripraśnottarādhyāya, (xvi) Grahaṇottarādhyāya, (xvii) Parilekhādhyāya, (xviii) Kuṭṭakādhyāya, (xix).....(?).....(xx) Chandaścityuttarādhyāya, (xxi) Golādhyāya, (xxii) Yantrādhyāya, (xxiii) Mānādhyāya, and (xxiv) Saṃjñādhyāya. According to some Mss. (e.g. IO/JE, v, *2768*), a 25th. ch. 'Dhyānādhikāra is added. Albīrūnī in his *Indica*, however, mentioned 24 chs. (I, 155) and excluded the 25th. ch. entitled 'Dhyāna-graha-adhyāya' on the ground that 'he (Brahmagupta) tries to solve the problems by speculation, not by mathematical calculation'. This work exerted considerable influence in the renaissance of Arab astronomy and mathematics in the 8th. century A.D.

Manuscript reference:

AS/KBK. p. 123, Bengali.
BANARAS. p. 259, *71*, 97 ff.
BERLIN. ii, part i, p. 291, *1733*, 89 ff.
BN/AC. i, *983(1)*, Nāgarī, 1860 A.D.; *995(iv)*, Bengali, 1840 A.D.
BU/GD. i, *370*, 43 ff. Nāgarī.
CSC/HS & SG. ix, p. 78, *71*, 123 ff. Bengali, Kuṭṭakādhyāya only.
IO/JE. v, *2768*, 27 ff. Nāgarī, 1621 A.D.; *2769*, 292 ff. Nāgarī; *2770*, 197 ff. Nāgarī; *2771*, 43 ff. Nāgarī, Kuṭṭakādhyāya only.
M&C/LR. *307*, Nāgarī.
NWP. v, p. 88, 48 ff. Nāgarī.
PU. ii, *3726*, 36 ff. Nāgarī.
RAS/BB/HV. *250*, ff. 2-60, Nāgarī, 1497 A.D.
TCC/TA. p. 44.
VVRI/VB. p. 78, *1781*, 175 ff. Nāgarī. incomplete; p. 79, *2363*, 66 ff. Nāgarī. incomplete.

Commentator:

Pṛthūdakasvāmin.

Printed text, translations etc.

Brahmasphuṭasiddhānta. Ed. with a commentary by Sudhākara Dvivedin, Benares, 1902. Originally published in the *PANDIT* (n.s.), **23-24,** 1901-2.

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Algebra with Arithmetic and Mensuration from the Sanskrit of Brahmegupta and Bhāscara. H. T. Colebrooke, London, 1817; contains translations with notes of part of the book.

Study

BENTLEY, J. *Historical view of Hindu Astronomy*, 151-58, 161, Calcutta, 1823.

CHATTERJEE, BINA. 'Geometrical Interpretation of the motion of the Sun, Moon and the five planets as found in the mathematical syntaxis of Ptolemy and in the Hindu astronomical works', *JASB*, **15,** 47-87, 1949.

COLEBROOKE, H. T. 'On the Indian and Arabian division of the zodiac', *AR*, **9,** 323-376, 1807.

COLEBROOKE, H. T. *Algebra with arithmetic and mensuration from the Sanskrit of Brahmegupta and Bhāscara*, London, 1817.

COLEBROOKE, H. T. 'Notes and Illustrations: (a) Astronomy of Brahmegupta, (b) Brahmasiddhānta, title of Brahmegupta's astronomy, (c) Verification of the text of Brahmegupta's treatise on astronomy, (d) Age of Brahmegupta inferred from astronomical data', *Misc. Essays*, ii, 445-56, 456-57, 458-61, 463-67, 1837.

DAS, SUKUMAR RANJAN. 'Motion of the earth as conceived by the ancient Indian astronomers', *BCMS*, **17,** 173-182, 1926.

DAS, SUKUMAR RANJAN. 'Astronomical instruments of the Hindus', *IHQ*, 256-69, 1928.

DAS, SUKUMAR RANJAN. 'Precession and Libration of the Equinoxes in Hindu astronomy', *JASB*, n.s. **23,** no. 3, 403-13, 1927.

DAS, SUKUMAR RANJAN. 'Co-ordinates used in Hindu astronomy', *AMM*, **35,** 535-40, 1928.

DAS, SUKUMAR RANJAN. 'Lunar and Solar eclipses in Hindu astronomy', *JASB*, n.s. **24,** no. 4, 437-54, 1928.

DATTA, B. 'On the supposed indebtedness of Brahmagupta to Chiuchang Suan-shu', *BCMS*, **22,** 39-51, 1930.

FLEET, J. F. 'Some Hindu values of the dimensions of the earth', *JRAS*, 463-70, 1912.

GANGULY, SARADAKANTA. 'The source of Indian solution of the so-called Pellian equation', *BCMS*, **19,** 151-76, 1928.

KAYE, G. R. *Hindu Astronomy*, *ASI/M*, **18,** 48, 71, 120, Calcutta, 1924.

KAYE, G. R. 'Ancient Hindu Spherical Astronomy', *JASB*, n.s. **15,** 153-89, 1919.

LESLEY, MARK. 'Bīrūnī on rising times and day light lengths', *CENTAURUS*, **5,** 121-41, 1957.

NEEDHAM, J. *Science and Civilisation in China*, **3,** 34(c), 90, 102, 119(b), 146, 147, Cambridge, 1959.

RODET, M. LEON. 'L'algèbre d'al-Khārizmī et les méthodes Indiennes et Grecques', *JA*, Series 7, **11,** 5-98, 1878.

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SARASVATI, T. A. 'Śreḍhīkṣetras or diagrammatical representations of Mathematical Series', *JORM*, **28,** no. 1-4, 74-85, 1961.

SARTON, GEORGE. *Introduction to the History of Science*. **1,** 409, 461, 463, 474-75, 570, Baltimore, Reprint, 1950.

SENGUPTA, P. C. 'Hindu Luni-Solar Astronomy', *BCMS*, **24,** 1-18, 1932.

SIMON, M. 'Zu Brahmegupta diophantischen Gleichungen zweiten Grades', *AM*, **20,** 280-81, 1913.

SINGH, AVADESH NARAYAN. 'On the Indian method of root extraction,' *BCMS*, **18,** 123-40, 1927.

SINGH, A. N. 'Hindu Trigonometry', *PBMS*, no. 1, 77-92, 1939.

SMITH, D. E. *History of Mathematics*, **1,** 157-60, 167; **2,** 380, 387, 445. Dover edition, 1958.

WEISSENBORN, H. 'Das Trapez bei Euclid, Heron und Brahmagupta', *AGM*, **12,** 1879.

WINTERNITZ, M. *Geschichte der Indischen Litteratur*. **3,** 563-64, 573, 575. Leipzig, 1922.

ZEUTHEN, H. G. 'Sur l'arithmétique géometrique des Grecs et des Indiens', *BM*, series 3, **5,** 97-112, 1904.

2. *Khaṇḍakādya or Khaṇḍakhādyaka.* खण्डखाद्य, खण्डखाद्यक

Composed about the year Śaka 587 or 665 A.D., this popular astronomical work, a *karaṇa*, has the following eight chapters: (i) Tithyadhikāra (on tithis); (ii) Grahādhikāra (on the mean and true places of planets); (iii) Tripraśnādhikāra (on the three problems relating to the diurnal motion); (iv) Candragrahaṇādhikāra (on lunar eclipses); (v) Sūryagrahaṇādhikāra (on solar eclipses); (vi) Udayāstādhikāra (on the rising and setting of planets); (vii) Śṛṅgonnatyadhikāra (on the position of the moon's cusps); (viii) Grahayutyadhikāra (on conjunction of planets). The edition of Prabodh Chandra Sengupta with the commentary by Pṛthūdakasvāmin gives a reconstruction of *Uttarakhaṇḍakhādyaka*, of which no copy appears to be extant, under the following chapter headings: (ix) Khaṇḍakhāḍyakottaram; (x) Khaṇḍakhādyake Bhaṭṭotpalapaṭhitā atiriktaślokāḥ (CU, 1941).

Manuscript reference:

ANUP, iv, p. 345, *92*, 9 ff. 1672 A.D.; *93*, 4 ff. 1609 A.D. fragment; *94*, 3 ff. fragment.

NEPAL/HS, i, p. 89, *3*, 1350 A.D.

PU, ii, *3314*, 17 ff. Nāgarī, 1840 A.D.; *3315*, 9 ff. Śāradā; *3316*, 87 ff. Śāradā.

RAS/BB/VM, p. xiv (2 copies)

RTL/MS, p. 257, 196 ff. Kāśmirī.

VVRI/VB, p. 76, *2461*, 18 ff. Nāgarī, 1550 A.D.; *5070*, 25 ff. Nāgarī. incomplete.

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Commentators:

Āmarāja, Bhaṭṭotpala, Lalla, Pṛthūdakaśvāmin, Someśvara, Śrīdatta, Varuṇa. (There seems to be a few more commentaries by Bhaṭṭotpala, Someśvara and Varuṇa but no Mss. of them are noticed).

Printed text, translations etc.

Khaṇḍakhādyaka with *Vāsanābhāṣya* by Āmarāja. Ed. with introduction by Babua Misra. Calcutta University, Calcutta, 1925.

Khaṇḍakhādyaka, translated into English with a short introduction by P. C. Sengupta, xxx+204, Calcutta University, 1934.

Khaṇḍakhādyakam-karaṇa with the commentary of Caturveda Pṛthūdakasvāmin. Ed. Prabodhacandra Sengupta. Calcutta University, Calcutta, 1941.

Study:

CHAKRABARTY, GURUGOVINDA. 'The growth and development of progressive series in India,' *JDL/CU.* **24,** 1-18, 1934.

KAYE, G. R. 'Hindu Astronomy', *ASI/M*, **18,** 48, Calcutta, 1924.

LESLEY, MARK. 'Bīrūnī on rising times and day light lengths', *CENTAURUS*, **5,** 121-41, 1957.

SCHMIDT, OLAF. 'On the computation of the Ahargaṇa', *CENTAURUS*, **2,** 140-80, 1951-53.

SCHMIDT, OLAF. 'The computation of the length of day light in Hindu astronomy', *ISIS*, **35,** 205-11, 1944.

SENGUPTA, P. C. 'Brahmagupta on interpolation', *BCMS*, **23,** 125-28, 1931.

SENGUPTA, P. C. 'Hindu Luni-solar Astronomy', *BCMS*, **24,** 1-18, 1932.

SACHAU, E. C. *Alberuni's India*, **1,** 156, 312; **2,** 7, 46, 49, 60, 79, 83, 86, 87-90, 91, 116, 119, 184, 187. London, 1910.

Brahmasiddhānta. see BRAHMAGUPTA.

Brahmasiddhānta. see SĀKALYA.

Brahmasiddhāntasāraṇī. ब्रह्मसिद्धान्तसारणी

An anonymous astronomical work containing mainly tables.

Manuscript reference:

PU, ii, *3727*, 45 ff. Nāgarī.

Brahmasiddhāntaṭīkā. see PADMANĀBHA, s.o. Narmada.

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Brahmasiddhāntatulya. see BHĀSKARĀCĀRYA.

Brahmasiddhānta-vāsanābhāsya. see PṚTHŪDAKASVĀMIN. s.o. Śrībhaṭṭa.

Brahmasiddhānta: Viṣṇudharmottarīya.
ब्रह्मसिद्धान्त–विष्णुधर्मोत्तरीय

One of the three extant *Brahmasiddhāntas*, the other two being the *Brahmasiddhānta* of Śākalya and the *Brahmasphuṭa-siddhānta* of Brahmagupta. This present version forms part of the *Viṣṇudharmottarapurāṇa*, (chs. 166-174 of khaṇḍa 11). These chs. are entitled as follows: (166) Śāstraśākhāvarṇana, (167) Jātakādhyāya, (168) Upakaraṇavivaraṇa, (169) Grahagati, (17) Tithinakṣatraprakaraṇa, (171) Chāyāprakaraṇa, (172) Lagnaprakaraṇa, (173) Udayāstamayaprakaraṇa, (174) Paitāmahaśāstra.

Manuscript reference:

BAṆARAS. p. 259, *70*, ff. 1-9

Apart from this Ms. which contains only the *Brahmasiddhānta* portion of the *Viṣṇudharmottarapurāṇa*, there are quite a number of Ms. of *Viṣṇudharmottarapurāṇa*, all of which of course contain the present. But such a survey, i.e., of Purāṇa Ms. was beyond the scope of this compilation.

Printed text, translations etc.

The Viṣṇudharmottarapurāṇa. Veṅkaṭeśvara Press, Bombay, 1912.

Brahmasphuṭasiddhānta. see BRAHMAGUPTA.

Brahmasphuṭasiddhāntaṭīkā. see SUDHĀKARA DVIVEDIN.

Brahmatulya. see BHĀSKARĀCĀRYA.

Brahmatulyagaṇita. ब्रह्मतुल्यगणित

An anonymous mathematical work.

Manuscript reference:

GUJARAT. iv. p. 168, *299*, 16 ff. 1653 A.D.

Brahmatulyasāra. see KEŚAVĀRKA.

Brahmatulyasiddhānta. see BHĀSKARĀCĀRYA.

Brahmatulyasiddhānta-vṛtti. see VIŚVANĀTHA DAIVAJÑA. s.o. Divākara Daivajña.

Brahmatulyasya grahasādhanārtha sāraṇī. ब्रह्मतुल्यस्य ग्रहसाधनार्थ सारणी

An anonymous astronomical work containing tables for computation.

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Manuscript reference:
CENSUS. p. 235, *4735*, ff. 2-10, 12-17, Nāgarī, 1798 A.D.

Brahmatulyodāharaṇa. see VIŚVANĀTHA DAIVAJÑA, s.o. Divākara Daivajña.

Bṛhajjātaka. see VARĀHAMIHIRA.

Bṛhat-bhāskarīya. see BHĀSKARA 1.

Bṛhatcintāmaṇi. see GAṆEŚA DAIVAJÑA, s.o. Keśava Daivajña.

Bṛhatcintāmaṇi-vāsanābhāṣya. see VIṢṆU DAIVAJÑA, s.o. Divākara Daivajña.

Bṛhatkalpalatā. see SOMA BHAṬṬA.

Bṛhat-kṣetrasamāsa-vṛtti. see SIDDHA SŪRI.

Bṛhatsaṃhitā. see VARĀHAMIHIRA.

Bṛhatsaṃhitā-vivṛti. see BHAṬṬOTPALA.

Bṛhat-tithicintāmaṇi. see GAṆEŚA DAIVAJÑA, s.o. Keśava Daivajña.

BUDHA SIṂHA.

Grahaṇādarśa. ग्रहणादर्श

Manuscript reference:
PU. ii, *3345*, 42 ff. Nāgarī, 1818 A.D.

Anonymous commentary:
Prabodhinī.

Buddhivilāsinī. see GAṆEŚA DAIVAJÑA, s.o. Keśava Daivajña.

CAKRACŪḌĀMAṆI

1. *Jyotiṣa-kalpataru.* ज्योतिषकल्पतरु

Manuscript reference:
GUJARAT. iv, p. 138, *143*, 138 ff.
UJJAIN. p. 54, *2110*, 20 ff. 1815 A.D.

2. *Siddhānta-śiromaṇi-ṭīkā.* सिद्धान्तशिरोमणिटीका

A commentary on the *Siddhānta-śiromaṇi* of Bhāskarācārya.

Manuscript reference:
NWP. v. p. 6, *23*, 62 ff. Nāgarī.

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Cakracūḍāmaṇi. चक्रचूडामणि

An anonymous work.

Manuscript reference:

GUJARAT. iv. p. 128, *87*, 9 ff.

CAKRADHARA. s.o. Varuṇa.

1. *Yantracintāmaṇi.* यन्त्रचिन्तामणि

A treatise on astronomical instruments in 4 chs., *viz.*, (i) Yantropakaraṇa-sādhana, (ii) Tripraśnādhikāra, (iii) Grahānayanādhikāra and (iv) Prakīrṇādhyāya, consisting of 26 verses in all.

Manuscript reference:

AS/HS & PS. x. p. 63, *6903*, 25 ff. Nāgarī, 1842 A.D.; *6904*, 16 ff, Nāgarī, 1672 A.D.; *6906*, 24 ff. Nāgarī.
AS/KBK. p. 154, Nāgarī.
BANARAS. p. 267, *115*, 10 ff.
BM/CB. *465*, 8 ff, Nāgarī, 18th. century.
CENSUS. p. 233, *4712*, 21 ff. Nāgarī, 1872 A.D.
CP/FK. p. 238, *123*, 11 ff. *124*, 28 ff.
IO/JE. v. *2909*, 16 ff. Nāgarī.
NU. p. 343, *1662*, 14 ff, Nāgarī; *1663*, 3 ff. Nāgarī; *1664*, 7 ff. Nāgarī; *1665*, ff. 8-11, Nāgarī; *1666*, 45 ff. Nāgarī, 1748 A.D.
NWP. ii. p. 114, *10*, 14 ff. Nāgarī.
PU. ii. *3544*, 4 ff. Nāgarī, 1673 A.D.; *3829*, 29 ff. Nāgarī.
RORI/JM. ii. *6107*, 29, ff. 1854 A.D; *6885*, 36 ff. 1903 A.D.
RTL/MS. p. 170, 77 ff.
VVRI/VB. *1062*, 11 ff. Nāgarī, 1772 A.D.

Commentator:

Rāma Daivajña.

Study:

MIDDLETON, J. J. 'Description of an Astronomical instrument presented by the Raja Ram Singh of Khota to the Govt. of India', *JASB*, **8**, 831-40, 1839.

2. *Yantracintāmaṇi-vivaraṇa.* यन्त्रचिन्तामणिविवरण

A commentary on the *Yantracintāmaṇi.*

Manuscript reference:

BANARAS. p. 267, *115*, 10 ff.
BM/CB. *465*, 8 ff. Nāgarī, 18th century.
IO/JE. v. *2909*, 16 ff. Nāgarī.
NWP. ii. p. 114, *10*, 14 ff. Nāgarī.

Cakranyāsa. चक्रन्यास

An astronomical work.

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Manuscript reference:
PU. ii. *3376*, 4 ff, Nāgarī.

CAKRAVIPRADĀSA.
Bhāsvatī-ṭīkā. भास्वतीटीका
A commentary on the *Bhāsvatī* of Śatānanda.
Manuscript reference:
OUDH. xiii. p. 62, *15*, 40 ff. Nāgarī.

Calarāśikalana. see SUDHĀKARA DVIVEDIN.

CAṆḌEŚVARĀCĀRYA of Mithilā (c. 1185 A.D.)
Sūryasiddhāntabhāṣya. सूर्यसिद्धान्तभाष्य 1185 A.D.
A commentary on the *Sūryasiddhānta.*
Manuscript reference:
AS/HS & PS. x. *6941*, 166 ff, Newari, 1710 A.D.
NEPAL/HS. i. p. 132, *1165*, 224 ff. Maithili.
RAS/BB/HV. *293*, 64 ff. Nāgarī.

CAṆḌĪDĀSA, s.o. Rāghava.
Karaṇakutūhala-ṭīkā. करणकुतूहलटीका
A commentary on the *Karaṇa-kutūhala* of Bhāskarācārya.
Manuscript reference:
AS/HS & PS. x. *6840*, 49 ff. Nāgarī, 1659 A.D.
FSM/TA. p. 85, *262*, 46 ff. 1750 A.D. incomplete.

Candracchāyāgaṇita. see GĀRGA.

Candracchāyāgaṇita. see NĪLAKAṆṬHA SOMASUTVAN.

Candracchāyāgaṇitaṭīkā. see GĀRGA.

Candracchāyāgaṇitaṭīkā. see NĪLAKAṆṬHA SOMASUTVAN.

Candragati-sāraṇī. चन्द्रगतिसारणी
An anonymous astronomical work.
Manuscript reference:
JRAS/1912, *261f*, 12 ff, Śāradā.

Candragrahaṇodāharaṇa. see PARAMASUKHA.

Cāndramāna. see GAṄGĀDHARA.

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Candraprajñaptisūtra. चन्द्रप्रज्ञप्तिसूत्र

It is a Jaina work in astronomy.

Manuscript reference:

AS/AB. *56*, 67 ff. Jaina Devanāgarī, complete. HR. Kāpādia mentions (*IHQ*, **8,** 381-82, 1932) four manuscripts in the Bhandarkar Oriental Research Institute.

Printed text, translations etc.

Candraprajñapti. Ed. with text in Hindi by Amolakrisi, Hyderabad, Vīrasambat 2445.

Study:

DAS, SUKUMAR RANJAN. 'A short chronology of Indian astronomy', *IHQ*, **7,** 139, 1931.

DAS, SUKUMAR RANJAN. 'The Jaina school of astronomy', *IHQ*, **8,** 36, 1932.

DATTA, B. 'The Jaina school of mathematics', *BCMS*, **21,** 117, 1929.

KAPADIA, H. R. ' A note on Candraprajñapti', *IHQ*, **8,** 381-82, 1932.

WINTERNITZ, M. *Geschichte der Indischen Litteratur*, **2,** 292, 316, Leipzig, 1920.

Candrārka-sāriṇī-koṣṭhaka. see KARPŪRARATNA.

Candrārkī. see DINAKARA of Bārejya.

Candrārkī-Saṃgraha. see DINAKARA.

Candrārkīsāriṇī. चन्द्रार्कीसारिणी

An anonymous work.

Manuscript reference:

VVRI/VB. *2528*, 4 ff. Nāgarī. incomplete.

Candrārkī-ṭīkā. see DINAKARA of Bārejya.

Candrārkī-udāharaṇa. see DINAKARA of Bārejya.

CANDRAŚEKHARA. (1835 A.D.)

Siddhāntadarpaṇa. सिद्धान्तदर्पण

A treatise on astronomical work. It has six chapters viz., (i) Madhyamādhikāra, (ii) Sphuṭādhikāra, (iii) Tripraśnādhikāra, (iv) Golādhikāra and (v) Kālādhikāra and Pariśiṣṭa.

Printed text, translations etc.

Siddhāntadarpaṇa. By Śrī Candraśekhara Simha. Ed. with an introduction by Jogeschandra Roy, Calcutta, 1899.

Study:

SENGUPTA, P. C. 'Hindu Luni-Solar Astronomy', *BCMS*, **24,** 1-18, 1932.

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CANDRAŚEKHARA.

Laghukṣetrasamāsavivaraṇa. लघुक्षेत्रसमासविवरण

A commentary on the *Laghukṣetrasamāsa.*

Manuscript reference:

RORI/JM. ii. *5913*, 32 ff. 1488 A.D.

CANDRAŚEKHARA PAṬANĀYAKA

Līlāvatyudāharaṇa. लीलावत्युदाहरण

A commentary on the Līlāvatī of Bhāskarācārya.

Manuscript reference:

CP/FK. p. 240, *142*, 169 ff. 1818 A.D.

COMPLIMENTARY

Candrasūryagrahagaṇita. see GAṆEŚA DAIVAJÑA.

Candrasūryagrahaṇa. चन्द्रसूर्यग्रहण

An anonymous astronomical work for calculating the eclipses of the sun and the moon.

Manuscript reference:

BN/AC. i. *961 (ii)*, Bengali, 19th. century.

RORI/JM. *5808*, 19 ff. 19th. century.

Cāpaprapañca. see KṚṢṆADATTA JHĀ.

Caraṇādhyāya. चरणाध्याय

An anonymous astronomical work dealing with months and year of the solar and lunar eclipses occurring during the Hindu 60 year cycle and giving rules for the occurrence of total and partial eclipses.

Manuscript reference:

MADRAS/D. xxiv, *13420*, 4 ff. Telugu.

Chādakanirṇaya. see KṚṢṆA DAIVAJÑA, s.o. Ballāla.

Chāyāgaṇita. see NĪLAKAṆṬHA SOMASUTVAN

Chedyakopapatti. छेद्यकोपपत्ति

An anonymous work.

Manuscript reference:

BORS/AB. iii, *67*, 7 ff. Nāgarī.

Cintāmaṇi. see DĀMODARA BHAṬṬA.

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CINTĀMAṆI, s.o. Jñānarāja.

Graha-gaṇitacintāmaṇi or *Siddhāntasundaravyākhyā.* ग्रहगणितचिन्तामणि, सिद्धान्तसुन्दरव्याख्या

A commentary on the *Siddhāntasundara* of his father, Jñanarāja.

Manuscript reference:

ANUP. v.p. 402, *36*, 171 ff.
BANARAS. p. 260, *96*, ff. 12-78.
GUJARAT. iv. p. 208, *529*, 55 ff. incomplete.
RAS/BB/HV. *291*, 50 ff. Nāgarī. incomplete.
RTL/MS. p. 176, 83 ff. incomplete.

CINTĀMAṆI. s.o. Vināyaka Somayājin of Cittapūrṇa (i.e. Cipaṭūṇa) town (1791 A.D.)

Golānanda. गोलानन्द 1791 A.D.

A small metrical work in 148 stanzas giving information about an astronomical instrument called *Golānanda.*

Manuscript reference:

BU/GD. i. *341*, 9 ff. Nāgarī.

Commentator:

Yajñeśvara.

Cintāmaṇi-sāraṇikā. see DAŚABALA.

COLA SŪRI. s.o. Āryasūrya.

Gaṇakopakāriṇī or *Sūryasiddhānta-vyākhyā.* गणकोपकारिणी, सूर्यसिद्धान्तव्याख्या

A commentary on the *Sūryasiddhānta.*

Manuscript reference:

MADRAS/D. xxiv. *13508*, 266 ff. Grantha; *13509*, 135 ff. Grantha. Both break off in the 13th. ch.
MADRAS/T. vol. ii. part i. Sanskrit C. *1706*, 102 ff. Nāgarī, 1915-16 A.D. Contains first 11 chs. only.
PU. ii. *4080*, 67 ff. Telugu; *4081*, 96 ff. Tamil. 6 chs. only; *4082*, ff. 132-170, Tamil. chs. 7-11 only.
TRI/TG. i. *180*. Malayalam; vii. *89*.

CŪḌĀMAṆI

Jyotissāra-samuccaya. ज्योतिस्सारसमुच्चय

Manuscript reference:

PU. ii. *3474*, 17 ff. incomplete.

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CŪḌĀMAṆI CAKRAVARTĪ.

Makarandasādhanaprakriyā. मकरन्दसाधनप्रक्रिया

An astronomical work dealing with the preparation of almanacs based on the *Tithipatra* of Makaranda.

Manuscript reference:

RORI/JM. ii. *6275*, 12 ff. 1890 A.D.

GUNNĪRĀMA (c. 1825 A.D.)

Karaṇa-bhūṣaṇa. करणभूषण 1825 A.D.

An astronomical manual for calculating the positions of the sun, moon and other planets in 5 chs. viz., (i) Sūryacandra-spaṣṭīkaraṇa, (ii) Tārāgraha-spaṣṭīkaraṇa, (iii) Upakaraṇa, (iv) Candragrahaṇānayana and (v) Sūryagrahaṇānayana.

Manuscript reference:

AS/HS & PS. x. *6832*, 16 ff. 1837 A.D.

DĀDĀBHĀI. s.o. Mādhava Gāṃkar of the Cittapāvana family (c. 1720)

Kiraṇāvalī or *Saurasāracandrakiraṇāvalī* or *Jāgaccandrakiraṇāvalī* or *Saurasūtravivaraṇa* or *Sūryasiddhāntavivaraṇa.* किरणावली, सौरसारचन्द्रकिरणावली, जगच्चन्द्रकिरणावली, सौरसूत्रविवरण, सूर्यसिद्धान्तविवरण 1719 or 1720 A.D.

A commentary on the *Sūryasiddhānta.*

Manuscript reference:

AS/HS & PS. x.°*6940*, ff. 1-44, 1-87, Nāgarī, 1792 A.D.
BN/AC. i. *304* (*II*), Bengali, 1840 A.D.
BODLEIAN. *772*, 128 ff. Bengali.
CSC/HS. & SG. ix. p. 171, *181*, 101 ff. Bengali.
IO/JE. v. *2780*, 86 ff. Nāgarī; *2781*, 77 ff. Nāgarī, 1719 A.D.
PU. ii. *4074*, 116 ff. Nāgarī, 1723 A.D.; *4075*, 93 ff. Nāgarī.
TCC/TA. p. 44, 132 ff. Nāgarī, 1805 A.D.
VVRI/VB. *2388*, 12 ff. Nāgarī, 1805 A.D. incomplete.

Daivajñabāndhava. see HARADATTA.

Daivajña-kalpalatā. see KODAṆḌARĀMA s.o. Veṅkaṭakṛṣṇa.

Daivajñavilāsa. see LALLA LAKṢMAṆA.

DĀMODARA.

Goloddeśa. गोलोद्देश

In this work an attempt is made to reconcile astronomy with the *Purāṇas.*

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Manuscript reference:
NEPAL/HS. i. p. 165, *1167*, 62 ff. Nāgarī, 1710 A.D.

DĀMODARA.

Pāṭīlīlāvatīṭīkā. पाटीलीलावतीटीका
A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:
GUJARAT. iv. p. 154, *231*, 14 ff.

DĀMODARA. pupil of Padmanābha.

Karaṇaprakāśa-vṛtti. करणप्रकाशवृत्ति
A commentary on the *Karaṇaprakāśa* of Brahmadeva Gaṇaka.

Manuscript reference:
IO/JE. v. *2915*, 13 ff. Nāgarī. A fragment.

DĀMODARA BHAṬṬA.

Yantracintāmaṇi or *Cintāmaṇi.* यन्त्रचिन्तामणि, चिन्तामणि
A treatise on the astronomical instruments.

Manuscript reference:
BN/AC. i. *1005* (*xvi*), Nāgarī, 18th century.
NU/VK. *1666*, 45 ff. Nāgarī, 1748 A.D.
OUDH. i. p. 14, *33*, 119 ff. Nāgarī.
RORI/JM. ii. *5646*, 61 ff. 1918 A.D.

DAŚABALA (c. 1055 A.D.), a Buddhist.

Cintāmaṇi-sāraṇikā or *Tithisāraṇikā.* चिन्तामणिसारणिका, तिथिसारणिका 1055 A.D.
An astronomical work in 5 chs. (i) . . . . . (ii) Nakṣatra-prakaraṇa, (iii) Yogaprakaraṇa, (iv) Prakīrṇakaprakaraṇa and (v) Saṅkrānti-saṃvatsarānayana-prakaraṇa.

Manuscript reference:
BODLEIAN. *776*, ff. 120-134, 1540 A.D.

Daśagītisūtra-vyākhyā. see BHŪTAVIṢṆU.

Daśapainna (*Daśaprakīrṇaka*). दशपैन्न (दशप्रकीर्णक)
An anonymous Jaina work of which the 8th. and 9th. *Painnas* deal with *Gaṇitavidyā*. It is divided into 9 parts, *viz.*, (i) Divasā, (ii) Tithi, (iii) Nakkhatta (Nakṣatra), (iv) Karaṇa, (v) Gaha (Graha), (vi) Divasayam Muhūttam, (vii) Saunna Balam (Sakuna Balam), (viii) Lagna Balam and (ix) Nimitta Balam.

Manuscript reference:
BERLIN. ii. part ii, *1870*, 41 ff. 1481 A.D. (8th. painna); *1871*, 17 ff. 1401 A.D. (9th. painna).

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DAYĀŚAṄKARA.
Grahadīpikā. ग्रहदीपिका

Manuscript reference:
GUJARAT. iv. p. 126, *69*, 8 ff.

DEVACANDRA.
Karmavipāka. कर्मविपाक

Manuscript reference:
CP/HL. p. 66, *697*.

DEVADATTA. s.o. Nāgeśa.
1. *Grahaprakāśa.* ग्रहप्रकाश

Manuscript reference:
BM/CB. *474D*, ff. 44-56, Nāgarī, 18th. century.

2. *Grahaprakāśaṭīkā.* ग्रहप्रकाशटीका
A commentary on the above work.

Manuscript reference:
BM/CB. *474D*, ff. 44-56, Nāgarī, 18th century.

DEVARĀJA. s.o. Varadācārya.
1. *Kuṭṭākāra-śiromaṇi.* कुट्टाकारशिरोमणि
An algebraic work on indeterminate equations, in 2 chs. viz., (i) Sāgrapariccheda and (ii) Niragrapariccheda.

Manuscript reference:
TANJORE/AB. p. 65, *3*, ff. 6-59, Grantha, 1700 A.D.

Printed text, translations etc.
Kuṭṭakaśiromaṇi, with the author's own commentary *Mahālakṣmīmuktāvalī* Ed. by Balavantaraya Dattātreya Apte, Ānandāśrama Sanskrit Series no. 125, Poona, 1944.

2. *Kuṭṭākāraśiromaṇiṭīkā* or *Mahālakṣmīmuktāvalī.*
कुट्टाकारशिरोमणिटीका, महालक्ष्मीमुक्तावली
A commentary by the author on his *Kuṭṭākāraśiromaṇi.*

Manuscript reference:
TANJORE/PPS. xvi, *11355*, 76 ff. Grantha. incomplete.

DEVĪSAHĀYA. s.o. Kṛṣṇakaura.
Līlāvatīvilāsa. लीलावतीविलास
A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript Reference:
AS/HS & PS. x, *6918*, 63 ff. Nāgarī, 1760 A.D.

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NWP. i. p. 518, *35*, 29 ff. Nāgarī.
RTL/MS. p. 172, 80 ff. Kāshmirī.
VVRI/VB. *5745*, 64 ff. Nāgarī.

Dhanaṅkarī-sāraṇī. धनंकरीसारणी

A guide book for the preparation of calendars.

Manuscript reference:
LEIPZIG/TA. *985*, 5 ff. 1761 A.D.

Dhanaphalī. धनफली

An anonymous astronomical table for converting lunar days into solar ones.

Manuscript reference:
IO/JE. v. *2967*, 24 ff. Nāgarī.

DHANARĀJAGAṆI. pupil of Bhojarājagaṇi (c. 1636 A.D.)

Mahādevīvṛttadīpikā or *Dīpikā.* महादेवीवृत्तदीपिका, दीपिका 1636 A.D.

A commentary on the *Māhadevī* of Mahādeva.

Manuscript reference:
GUJARAT. iv. p. 172, *327*, 59 ff. 1608 A.D.
RAS/BB/HV. *254*, 30 ff. Nāgarī.
RORI/JM. ii, *7136*, ff. 9-32, 18th. century.

DHANEŚVARA.

Siddhāntaśiromaṇi-bhāṣya. सिद्धान्तशिरोमणिभाष्य

A commentary on the *Siddhāntaśiromaṇi* of Bhāskarācārya.

Manuscript reference:
VVRI/VB. *4617*, 37 ff. Nāgarī, incomplete.

DHANEŚVARA. s.o. Vīreśvara, s.o. Someśvara (earlier than 1541 A.D.)

Līlāvatībhūṣaṇa. लीलावतीभूषण

A commentary on the *Līlāvatī* of Bhāskarācārya. It contains quotations from Sūryadāsa's *Amṛtakūpikā* (1541 A.D.), a commentary on the *Līlāvatī.*

Manuscript reference:
RAS/BB/HV. *275*, 95 ff. Nāgarī, incomplete.

DHANEŚVARA BHAṬṬA.

Sūrya-siddhānta-ṭīkā. सूर्यसिद्धान्तटीका

It is a commentary on the *Sūryasiddhānta.*

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Manuscript reference:
GUJARAT. iv. p. 210, *445*, 25 ff. 1465 A.D.

DHANEŚVARA DAIVAJÑA.

Sāraṇī tathā koṣṭhaka. सारणी तथा कोष्ठक

Manuscript reference:
GUJARAT. iv. p. 206, *509*, 13 ff.

DHANURJAYĀCĀRYA.

Jyotiṣa-candrodaya. ज्योतिषचन्द्रोदय

Manuscript reference:
CP/HL. p. 173, *1866*.

DHARMACANDRA

Tithikalpadruma. तिथिकल्पद्रुम

Manuscript reference:
RAS/BB/VM. p. xlviii.

DHARMAPĀṬHIN

Gaṇitādarśa. गणितादर्श

An astronomical work containing the following 8 chs. *viz.*, (i) Madhyādhikāra, (ii) Tithyadhikāra, (iii) Grahasphuṭādhikāra, (iv) Dṛkcakrodayādhikāra, (v) Upakaraṇādhikāra, (vi) Candragrahaṇādhikāra, (vii) Sūryagrahaṇādhikāra and (viii) Pariveśādhikāra.

Manuscript reference:
MADRAS/T. vol. iii. part i. Sanskrit B, *3288*, 11 ff. Nāgarī. 1920-21 A.D.

Dhīkoṭī. see ŚRĪPATI. s.o. Nāgadeva.

Dhīkoṭīgrahakaraṇa. see ŚRĪPATI. s.o. Nāgadeva.

Dhīkoṭīkaraṇa. see ŚRĪPATI. s.o. Nāgadeva.

Dhīkoṭīṭīkā. see HARIKṚṢṆA.

Dhīkoṭīṭīkā. धीकोटीटीका

An anonymous commentary on the *Dhīkoṭikaraṇa* of Śrīpati.

Manuscript reference:
OUDH. vii. p. 4, *10*, 14 ff, Nāgarī.
RAS/BB/VM. p. xlviii. 5 ff.

Dhīvṛddhidatantra. see LALLA. s.o. Bhaṭṭa Trivikrama.

Dhruva-bhramaṇa. see LAKṢMĪPATI

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Dhruva-bhramaṇa. see NĀRMADĪYA KṚṢṆA.

Dhruva-bhramaṇalokavidhi. ध्रुवभ्रमणलोकविधि
An anonymous work.

Manuscript reference:
UDAIPUR. p. 64, *558.*

Dhruva-bhramaṇa-yantravyākhyā. see GAṆEŚA DAIVAJÑA, s.o. Keśava Daivajña.

Dhruvamānasa. see ŚRĪPATI. s.o. Nāgadeva.

ḌHUṆḌHIRĀJA. s.o. Nṛsiṃha of Pārthapura (latter half of 16th century).

1. *Āyanatattva* or *Sāyanatattva.* आयनतत्त्व, सायनतत्त्व

Manuscript reference:
AS/HS & PS. x. *6831*, 32 ff. Nāgarī.
BORS/AB. iii. *400*, 18 ff. Nāgarī, 1863 A.D.

2. *Grahamaṇi.* ग्रहमणि 1589 A.D.
A short astronomical treatise.

Manuscript reference:
AS/HS & PS. x. *6848*, 3 ff. Nāgarī.

3. *Makarandodāharaṇa* or *Makaranda-pañcāṅgopapatti* or *Makarandavāsanā.* मकरन्दोदाहरण, मकरन्दपञ्चाङ्गोपपत्ति, मकरन्दवासना 1590 A.D.
A commentary on the *Tithipatra* of Makaranda.

Manuscript reference:
BORS/AB. iii. *247*, 3 ff. Maithili; *247A*, 5 ff. Maithili, 1837 A.D.
PU. ii. *3775*, 9 ff. Nāgarī.

4. *Pañcāṅgaphala.* पञ्चाङ्गफल

Manuscript reference:
GUJARAT. iv. p. 152, *212*, 12 ff. 1800 A.D.

Diksādhanāyantra. दिक्साधनायन्त्र
An anonymous work.

Manuscript reference:
GUJARAT. iv. p. 148, *193*, 2 ff. 1582 A.D.

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Dinacandrikā. see RĀGHAVĀNANDA CAKRAVARTIN.

DINAKARA of Bārejya. (c. 1578 A.D.)

1. *Candrārkī.* चन्द्रार्की (1578 A.D.)

A short astronomical work in 33 verses dealing with the true place of the moon and the sun. The epochal year adopted in this work is 1500 *Śaka.*

Manuscript reference:

BN/AC. ii. *1005* (*viii*), Nāgarī, 18th century.
BODLEIAN. *775*, ff. 59-65, 18th century.
CENSUS. *4716*, 5 ff. Nāgarī.
GUJARAT. iv. p. 128, *90*, 4 ff. 1681 A.D.
IO/JE. v. *2948*, 2 ff. Nāgarī. Fragment.
RORI/JM. ii. *4745*, 14 ff. 18th. century; *4870*, 3 ff. 1839 A.D.

2. *Candrārkī-saṃgraha.* चन्द्रार्कीसंग्रह

Manuscript reference:

CENSUS. p. 234, 3 ff. Nāgarī.

3. *Candrārkī-ṭīkā* or *Candrārkī-udāharaṇa.* चन्द्रार्कीटीका, चन्द्रार्की-उदाहरण

A commentary on his *Candrārkī.*

Manuscript reference:

GUJARAT. iv. p. 128, *81*, 49 ff. *92*, 22 ff.

4. *Kheṭasiddhi* or *Laghukheṭasiddhi.* खेटसिद्धि, लघुखेटसिद्धि 1578 A.D.

An astronomical work describing the method of finding the true places of the planets, the epochal year of which is 1500 *Śaka.* It follows the *Brahmasiddhānta,* together with the corrections suggested by *Rājamṛgāṅka.*

Manuscript reference:

ANUP. iv. p. 345, *3*, 83 ff.
GUJARAT. iv, p. 122, *46*, 84 ff.
IO/JE. v. *2947*, 91 ff. Nāgarī.
RORI/JM. ii, *4731*, 30 ff. 19th century.

DINAKARA.

Makarandavivaraṇa. मकरन्दविवरण

A commentary on the *Tithipatra* of Makaranda.

Manuscript reference:

NWP. i. p. 548, *114*, 25 ff. Nāgarī.

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DINAKARA. (1845 A.D.)

Tithyādicintāmaṇi. तिथ्यादिचिन्तामणि 1845 A.D.

An astronomical tract based on Gaṇeśa Daivajña's *Grahalāghava* and *Tithicintāmaṇi.*

Manuscript reference:

CENSUS. *4718*, 2 ff, Nāgarī.

Dinamānasāriṇī. दिनमानसारिणी

An anonymous astronomical work.

Manuscript reference:

VVRI/VB. *4482*, 8 ff. Nāgarī.

Dīpikā. see DHANARĀJA GAṆI

Dīrghavṛttalakṣmaṇa. see SUDHĀKARA DVIVEDIN.

DIVĀKARA. s.o. Nṛsiṃha and father of Viśvanātha Daivajña. (1606 A.D.)

1. *Makarandavivaraṇa.* मकरन्दविवरण

A commentary on the *Tithipatra* of Makaranda.

Manuscript reference:

AS/HS & PS. x, *6893*, 15 ff. Nāgarī. 1894 A.D; *6897*, 15 ff. Nāgarī. 1688 A.D.
BANARAS. p. 264, *74*, 14 ff.
BERLIN. i. p. 259, *864*, 18 ff.
BN/AC. i, *212* (*ix*), Nāgarī. 18th. century; *957* (*iii*), Bengali. 1840 A.D.
CENSUS. p. 234, *4720*, 18 ff. Nāgarī. 1865 A.D; *4721*, ff. 6-7, Nāgarī. 1796 A.D; *4722*, 11 ff. Nāgarī. 1800 A.D.
GUJARAT. iv. p. 170, *315*, 15 ff.
NOTICES/RM. iii, *1301*, 15 ff. Nāgarī. 1658 A.D.
NWP. ii. p. 80, *13*, 16 ff.
OUDH (1890). p. 110, *35*, 22 ff. Nāgarī.
PU. ii, *3767*, 11 ff. Nāgarī; *3768*, 13 ff. Nāgarī. 1780 A.D; *3776*,8 ff. Nāgarī.
RORI/JM. ii. *5732*, 9 ff. 1894 A.D; *7516*, 21 ff. 1936 A.D.
VVRI/VB. *2352*, 12 ff. Nāgarī. 1790 A.D.; *2538*, 7 ff. Nāgarī.

Printed text, translations etc.

Makarandavivaraṇa by Divākara Daivajña. Benares. Benarasi Press, 1880.
Makarandavivaraṇa by Divākara Daivajña. Ed. Umāśaṅkara Śarmā. Benares. 1886.
Aruṇodaya (containing *Makarandavivaraṇa*). 1890 A.D.

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2. *Pātasāriṇīṭīkā.* पातसारिणीटीका
A commentary on the *Pātasāriṇī* of Gaṇeśa Daivajña.
Manuscript reference:
AS/HS & PS. x. *6948*, ff. 1-4, Nāgarī. 1789 A.D.

3. *Rāmavinodaprakāśapaddhati.* रामविनोदप्रकाशपद्धति
Manuscript reference:
OUDH. (1890). p. 118, *72*, 18 ff. Nāgarī.

4. *Tattvacintāmaṇi* or *Gaṇitatattva-cintāmaṇi.*
तत्त्वचिन्तामणि, गणिततत्त्वचिन्तामणि
Manuscript reference:
GUJARAT. iv. p. 140, *150*, 33 ff. 1648 A.D.
NWP. ii. p. 80, *9*, 10 ff. Nāgarī.

DIVĀKARA.
Gaṇitāmṛtasāriṇī. गणितामृतसारिणी
Manuscript reference:
OUDH (1890). p. 122, *83*, 12 ff. Nāgarī.

DIVĀKARA.
Kṣetrasādhanā. क्षेत्रसाधना
Manuscript reference:
PU. ii. *3312*, 3 ff.

Divasagaṇānayanavidhi. दिवसगणानयनविधि
An anonymous astronomical work.
Manuscript reference:
PU. ii. *3558*, 4 ff, Nāgarī.

Dṛggaṇita. see KṚṢṆARĀYAR.

Dṛggaṇita. see PARAMEŚVARA.

Dṛggaṇita. see RAGHUNĀTHA.

Dṛggaṇita. दृग्गणित
An anonymous astronomical work dealing with rules of computation for compiling calendars from direct observation of heavenly bodies.
Manuscript reference:
MADRAS/T, i. part i. Sanskrit A, *103*(*a*), ff. 1a-12b. Grantha.

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Dṛggolavarṇana. see GIRIDHĀRI MIŚRA.

Dṛkkarma-vyākhyā. see NĪLĀMBARA JHĀ.

Dṛkkarmopapatti. दृक्कर्मोपपत्ति

Manuscript reference:
PU. ii. *3559*, 9 ff. Nāgarī.

Dṛkpākṣasāraṇī. see JAYASIṂHA.

DURGĀŚAṄKARA.

Sūryagrahādi-sādhana-siddhānta. सूर्यग्रहादिसाधनसिद्धान्त

Manuscript reference:
RORI/JM. ii. *5653*, 905 ff. 1893 A.D.

DVĀRAKĀNĀTHA. s.o. Bhaṭṭa.

Baudhāyana-śulbasūtravyākhyā or *Śulbadīpikā*.
बौधायनशुल्वसूत्रव्याख्या, शुल्वदीपिका

It is a commentary on the *Śulbasūtra* of Baudhāyana. See Baudhāyana.

Manuscript reference:
AS/HS. p. 518, *606*, 17 ff. Nāgarī. Incomplete.
AS/KBK. p. 121, Nāgarī; p. 122, Nāgarī.
BANARAS/TU & SJ. p. 372, *4084*, 66 ff. Nāgarī; p. 402, *4412*,48 ff. Nāgarī.
BU/HV. p. 24, *124*, 63 ff. Nāgarī, 1893 A.D.
IO/JE. *292*.
PU. i. p. 56, *481*, 49 ff. *482*, 48 ff.
TANJORE/AB. p. 20, *126*, 87 ff. Nāgarī.

EKANĀTHA. s.o. Caṇḍika of Vāripurī. (c. 1600 A.D.)

Gaṇakaprakāśa. गणकप्रकाश

A manual of astronomy in 9 chs. containing 74 ślokas in all. The chs. are: (i) Dhruvakasiddhi, (ii) Pañcāṅgasādhana, (iii) Grahaspaṣṭīkāraṇa, (iv) Lagneṣṭakāla-natonnata-carakhaṇḍa-carasvadeśodaya-sādhana, (v) Dvādaśabhāvasādhana, (vi) Candragrahaṇasādhana, (vii) Sūryagrahaṇasādhana, (viii) Valanaparilekhādhyāya and (ix) Mahāpātādhyāya. This work must have been written before 1621 A.D., which is the date of the original of the Ms. in RAS/BB/HV.

Manuscript reference:
RAS/BB/HV. *228*, 6 ff, Nāgarī. Probably copied in 1865 A.D. from a manuscript of 1621 A.D.
RAS/BB/VM. p. xlv. 6 ff.

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EKANĀTHA. s.o. Śārṅga and younger brother of Viṣṇu.

Karaṇakutūhala-ṭīkā. करणकुतूहलटीका

A commentary on the *Karaṇakutūhala* of Bhāskarācārya. This commentary, in addition to quoting from Lalla, the *Sūryasiddhānta*, the *Siddhāntaśiromaṇi* etc., quotes from the following works, viz., *Karaṇaśiromaṇi* of Vaidyanātha, *Karaṇābhiṣṭha* of Bhānu Daivajña, and *Kheṭasiddhi* of Padmanābha.

Manuscript reference:

LEIPZIG/TA. *969*, 86 ff. 1647 A.D. Incomplete.

Ekāśīti-cakrodhāra. एकाशीतिचक्रोधार

An anonymous astronomical work.

Manuscript reference:

GUJARAT. iv, p. 116, *15*, 7 ff.

Gaṇakabhūṣaṇa-ṭīkā. see RĀMADATTA.

Gaṇakadarpaṇa. गणकदर्पण

An anonymous astronomical work dealing mainly with eclipses.

Manuscript reference:

MADRAS/D. Supplement. xxviii, *15722*, 2 ff. Telugu.

Gaṇaka-kumuda-kaumudī. see HARṢA GAṆI.

Gaṇakamaṇḍana. see NANDĪKEŚVARA s.o. Vedāṅgarāja.

Gaṇakānanda. see SŪRYA.

Gaṇakānanda. see SŪRYA. s.o. Bālāditya.

Gaṇakānanda. गणकानन्द

An anonymous astronomical work with Telugu commentary.

Manuscript reference:

MADRAS/T. vol. i. part i, Sanskrit B, *457(c)*, ff. 98a-136b Telugu.

Gaṇakaprakāśa. see EKANĀTHA. s.o. Caṇḍika.

Gaṇaka Taraṅgiṇī. see SUDHĀKARA DVIVEDIN.

Gaṇaka Vallabha. see NARAHARI SŪRI. s.o. Nṛsiṃha Sūri.

Gaṇakopakāriṇī. see COLA SŪRI. s.o. Āryasūrya.

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Gaṇanāvicāra. गणनाविचार

An anonymous work.

Manuscript reference:

PU. ii, *3323*, 7 ff. Nāgarī.

GAṆAPATI BHAṬṬA.

Bhāsvatī-vivṛti. भास्वतीविवृति

A commentary on the *Bhāsvatī* of Śatānanda.

Manuscript reference:

AS/HS & PS. x, *6391*, 4 ff, Bengali, 17th century. Incomplete.

Gaṇasūryakoṣṭaka. गणसूर्यकोष्टक

An anonymous astronomical treatise.

Manuscript reference:

GUJARAT. iv. p. 122, *46*, 2 ff.

GAṆEŚA s.o. Ḍhuṇḍhirāja Daivajña.

Gaṇitamañjarī or *Gaṇitaracanāmañjarī.* गणितमञ्जरी, गणित-रचनामञ्जरी

A work on arithmetic and mensuration.

Manuscript reference:

CSC/HS. & SG. ix, *71*, ff. 40-89.
IO/JE. v, *2881*, 52 ff, Nāgarī. Incomplete.

GAṆEŚA. s.o. Jñāneśvara. s.o. Mahādeva. s.o. Lālabhaṭṭa. s.o. Somanātha.

Tithimañjarī. तिथिमञ्जरी

Manuscript reference:

FSM/TA. p. 85, *266*, 30 ff. 1740 A.D.

GAṆEŚA. s.o. Śrīdhara of Nandīgrāma.

Kṣetraganita. क्षेत्रगणित

A manual on mensuration.

Manuscript reference:

MADRAS/D. xxiv, *13403*, 15 ff. 1837 A.D.

GAṆEŚA DAIVAJÑA. s.o. Keśava Daivajña of Nandīgrāma (1507 A.D.)

1. *Bṛhat-tithicintāmaṇi* or *Bṛhatcintāmaṇi.* बृहत्तिथिचिन्तामणि, बृहत्चिन्तामणि

A short treatise on the preparation of a lunar calendar in

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11 chs. *viz*, (i) Upakaraṇa-sādhanā, (ii) Saṅkrāntyādisiddhi, (iii) Pakṣāntatithisiddhi, (iv) Sūkṣmanakṣatrānayana, (v) Grahaṇadvayasādhanā, (vi) Candrāgrahaṇa, (vii) Sūryagrahaṇa, (viii) Ayanāṃśa-krāntyādisādhanā, (ix) Tithīpatradeva (?), (x) Grahaṇadvayasādhanā and (xi) Dṛggaṇitaikavākyasthāpanā. But there seems to be another version of the text, printed in Ānandāśrama Sanskrit Series No. 120. which contains only 27 stanzas with apparently no chapter division.

Manuscript reference:

BM/CB. *460*, 6 ff. *461*, 1 ff. Nāgarī. 19th century.
RAS/BB/HV. *237*, 8 ff. Nāgarī. incomplete.

Commentator:

Viṣṇu Daivajña.

Printed text, translations etc.

Bṛhattithicintāmaṇi, with the commentary *Subodhinī* by Viṣṇu Daivajña. Ed. D. V. Apte. Ānandāśrama Sanskrit Series no. 120. Poona, 1942.

2. *Buddhivilāsinī* or *Līlāvatīvivṛti*. बुद्धिविलासिनी, लीलावतीविवृति 1545 A.D.

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

AS/KBK. p. 168, Bengali.
BANARAS. p. 256, *98*, 21 ff. incomplete.
BORS/AB. iii, *220*, 84 ff. Maithili. 1845 A.D.; *220A*, 66 ff. Maithili, 1845 A.D; *220B*, 89 ff. Maithili; *220C*, 42 ff. Maithili; *322*, 43 ff. Maithili.
CSC/HS & SG. ix. p. 178, *191*, 84 ff. Nāgarī. 1899 A.D.
IO/JE. v. *2811*, 105 ff. Bengali. 1658 A.D; *2812*, 100 ff. Nāgarī. 1797 A.D.; *2813*, 96 ff. Nāgarī. 1812 A.D.
MADRAS/D. xxiv. *13485*, 125 ff, Grantha. incomplete.
NWP. i. p. 550, *120*, 112 ff. Nāgarī; v. p.4, *18*, 144 ff. Nāgarī; viii. p. 58, *22*, 66 ff. Nāgarī.
OUDH. xiii. p. 60, *5*, 196 ff. Nāgarī; i. p. 106, *11*, 50 ff. Nāgarī.
PU. ii. *3906*, 14 ff. Nāgarī; *3907*, 17 ff. Nāgarī.
RTL/MS. p. 172, 80 ff. incomplete.
VVRI/VB. *2390*, 10 ff. Nāgarī. incomplete.

3. *Dhruvabhramaṇayantravyākhyā*. ध्रुवभ्रमणयन्त्रव्याख्या

A commentary on the *Dhruvabhramaṇayantra* of Padmanābha

Manuscript reference:

RAS/BB/VM. p. xlix. 10 ff.
VVRI/VB. p. 77, *2481*, 18 ff. 1663 A.D.

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4. *Grahalāghava* or *Siddhāntarahasya* or *Siddhāntalāghava*. ग्रहलाघव, सिद्धान्तरहस्य, सिद्धान्तलाघव

An astronomical work in 14 chs. Viśvanātha, Mallāri and Sudhākara Dvivedin, who commented on this work, include 16 chs. *viz.*, (i) Madhyamādhikāra, (ii) Ravicandraspaṣṭādhikāra, (iii) Pañcatārāspaṣṭīkaraṇādhikāra, (iv) Tripraśnādhikāra, (v) Candragrahaṇādhikāra, (vi) Sūryagrahaṇādhikāra, (vii) Māsagaṇādhikāra, (viii) Grahaṇadvayasādhanādhikāra, (ix) Udayāstādhikāra, (x) Cchāyādhikāra, (xi) Nakṣatracchāyādhikāra, (xii) Śṛṅgonnatyadhikāra, (xiii) Grahayutyadhikāra, (xiv) Pātādhikāra, (xv) Pañcāṅgacandra-grahaṇānayanādhikāra, (xv) Upasaṃhārādhikāra.

Manuscript reference:

ANUP. iv. p. 348 *132*, 28 ff. end missing; *133*, 26 ff. 1671 A.D; *134*, 22 ff. 1639 A.D.; *135*. 15 ff. 1671 A.D.; *136*, 10 ff.; *137*, 4 ff. 1 ch. only.

AS/HS & PS. x. *6861*, 15 ff. Nāgarī. incomplete.

BANARAS. p. 262. *67*; *140*; *148*; *175*.

BERLIN. p. 237, *845*, 18 ff.

BIK/RM. p. 295, *635*, 28 ff. Nāgarī.

BM/CB. *453*, 42 ff. Nāgarī. 19th. century; *454*, 36 ff. Nāgarī. 1773 A.D.; *455*, 6 ff. Nāgarī; *456*, 21 ff. 1765 A.D.

BORS/AB. iii. *55*, 22 ff. Maithili. 1809 A.D; *55A*, 15 ff. Maithili. 1790 A.D.; *55B*, 21 ff. Maithili. 1844 A.D.; *55C*, 14 ff. Maithili. 1843 A.D.; *55D*, 22 ff. Maithili; *55E*, Maithili, 14 ff. 1816 A.D.; *55F*, Maithili. 17 ff. 1864 A.D.; *55G*, 20 ff. Maithili. 1837 A.D.; *55H*, 12 ff. Maithili; *55I*, 18 ff. Maithili, 1851 A.D.; *55J*, 21 ff, Maithili; *55K*, 15 ff. Maithili; *408*, 18 ff. Maithili. 1833 A.D.

BU/GD. i. *344*, 25 ff. Nāgarī.

CENSUS. p. 232. *4683*, 9 ff. Nāgarī; *4684*, 19 ff. Nāgarī. 1844 A.D.; *4685*, 17 ff. Nāgarī. incomplete; *4686*, 7 ff. Nāgarī; *4687*, 24 ff. Nāgarī. 1857 A.D. *4688*, 10 ff. Nāgarī. *4689*, 34 ff. Nāgarī. 1816 A.D.; *4690*, 12 ff. Nāgarī; *4691*, 15 ff. Nāgarī; *4692*, 24 ff, Nāgarī; *4693*, ff. 1-30, 1-40, 1-30. Nāgarī.

CP/FK. p. 226, *25*, 88 ff.

CSC/HS & SG. ix. *8*, 35 ff, Nāgarī; *9*, 73 ff. Nāgarī; *14*, 18 ff. Nāgarī. incomplete.

FSM/TA. p. 85, *266*, 35 ff. 1795 A.D.

GUJARAT. iv. p. 126, *74*, 32 ff. 1796 A.D.; p. 128, *78*.

IO/AK. ii. part i. p. 777, *6305*, 3 ff. Bengali.

IO/JE. v. *2931*, 119 ff. Nāgarī; *2932*, 85 ff. Nāgarī; *2933*, 85 ff. Nāgarī; *2934*, 80 ff. Nāgarī; *2935*, 77 ff. Nāgarī; *2936*, 15 ff. Nāgarī. 1796 A.D.; *2937*, 95 ff. Nāgarī. 1700 A.D.; *2938*, 14 ff. Nāgarī. fragment. 1750; *2939*, 14 ff.

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Nāgarī. 1790 A.D. fragment; *2940*, 10 ff. Nāgarī. 1796 A.D. fragment.
LEIPZIG/TA. *970*; *971*; *972*; *973*; *974*, *975*.
M & C/LR. *280*, Nāgarī. incomplete.
MADRAS/D. xxiv. *13417*, 171 ff, Telugu. 1864 A.D.
MADRAS/T. vol. i. part i. Sanskrit A, *199*, 58 ff. Telugu.
MYSORE/AM. p. 51, *316*, 14 ff, Grantha. incomplete.
NOTICES/RM. vi. p. 49, *2024*, 34 ff. Nāgarī.
NU/VK. *522*, 14 ff. Nāgarī; *523*, 30 ff. Nāgarī; *524*, 12 ff. Nāgarī; *525*, 70 ff, Nāgarī; *526*, 15 ff, Nāgarī. 1679 A.D; *527*, 59 ff. Nāgarī. 1860 A.D.; *528*, 10 ff, Nāgarī; *529*, 24 ff. Nāgarī. 1868 A.D.; *530*, 77 ff, Nāgarī. 1801 A.D.; *531*, 19 ff, Nāgarī; *532*, ff. 13-26. Nāgarī; *533*, 94 ff. Nāgarī. 1801 A.D.
OUDH. i. p. 130, *116*, 48 ff. Nāgarī.
OXFORD. *99*, 33 ff. Nāgarī, 19th. century, incomplete.
PU. ii. *3351*, 22 ff. 1839 A.D.; *3352*, 26 ff. 1822 A.D.; *3353*, 21 ff. 1667 A.D.; *3354*, 22 ff; *3355*, 11 ff. incomplete; *3356*, 4 ff. fragment; *3357*, ff. 9-24, 1771 A.D. incomplete; *3358*, 15 ff. incomplete.
RAS/BB/HV. *234*, 8 ff. Nāgarī. 1520 A.D. incomplete.
RTL/MS. xix. p. 158, 21 ff, Kashmiri.
TANJORE/PPS. xvi. p. 7563, *11363*, 29 ff. Nāgarī.
TCC/TA. p. 57, 21 ff. Nāgarī. 18th century.
VVRI/VB. p. 76, *2356*, 27 ff. Nāgarī. 1688 A.D. incomplete; *2570*, 3 ff. Nāgarī. incomplete; *6556*, 14 ff. Nāgarī. incomplete; *6938*, 70 ff. Nāgarī.

Commentators:

Gaṅgādhara, Kamalākara, Keśava Daivajña, Mallāri, Mayadānava, Nārāyaṇa Daivajña, Nṛsiṃha Prema and Viśvanātha Daivajña.

Anonymous commentary:

Grahalāghavodāharaṇa.

Printed text, translations etc.

Grahalāghava, with a commentary by Mallāri. Ed. L. Wilkinson. Calcutta. 1843.

Grahalāghava or *Siddhāntalāghava*. A treatise on astronomy of Ganeśa Daivajña with Mallāri's commentary. Calcutta, 1886.

Phalitajyotiṣa, 3rd part, containing the *Sūryasiddhānta* with the commentary of Raṅganātha, the *Grahalāghava* with the commentary of Viśvanātha, the *Jātakābharaṇa* from the *Laghujātaka* of Varāhamihira with the commentary of Utpala, and the *Siddhāntaśiromaṇi* (*Golādhyāya*) of Bhāskarācārya with his own *Vāsanābhāṣya*. Ed. with Bengali translation by Rasikamohana Cattopadhyaya. Calcutta. 1887.

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Grahalāghavam karaṇam with the commentaries of Mallāri, Viśvanātha and Sudhākara Dvivedin. Ed. Sudhākara Dvivedin. Benares. 1904.

Grahalāghava, with the commentary, *Sudhāmañjarī* by Sītārama Jhā. 2nd. edition. Benares. 1941.

Study:

BENTLEY, J. *Historical view of Hindu Astronomy*, 168, Calcutta. 1823.

DAVIS, SAMUEL. 'On the astronomical computations of the Hindus', *AR*, **2**, 225-87.

WINTERNITZ, M. *Geschichte der Indischen Litteratur*, **3**, 565, Leipzig, 1922.

5. *Grahalāghava-vivṛti*. ग्रहलाघवविवृति

A commentary by the author on his own *Grahalāghava*.

Manuscript reference:

AS/KBK. p. 60, Nāgarī.

CSC/HS & SG. ix. *13*, 152 ff. incomplete.

6. *Laghucintāmaṇi* or *Laghutithicintāmaṇi* or *Tithisiddhi* or *Tithicintāmaṇi* or *Pañcāṅgasādhana*. लघुचिन्तामणि, लघु-तिथिचिन्तामणि, तिथिसिद्धि, तिथिचिन्तामणि, पञ्चाङ्गसाधन 1552 A.D.

It is the author's own abridgement of a bigger work called *Cintāmaṇi* (*Bṛhatcintāmaṇi*). It consists of 18 stanzas and gives the easiest and quickest methods of astronomical calculations.

Manuscript reference:

ANUP. iv. p. 361, *31*, 20 ff.; *32*, 12 ff. incomplete.
AS/HS & PS. x. 3 ff. Nāgarī.
BANARAS. p. 269, *155*, 4 ff. 1874 A.D.
BM/CB. *463*, 4 ff. Nāgarī. 1829 A.D.
BU/GD. i. *351*, 7 ff. Nāgarī; *352*, 2 ff. Nāgarī; *353*, 8 ff. Nāgarī; *354*, 4 ff. Nāgarī.
CENSUS. *4678*, 4 ff. Nāgarī; *4679*, Nāgarī. 1730 A.D; *4680*, 12 ff. Nāgarī.
CP/FK. p. 230. *56*, 9 ff.
CSC/HS & SG. ix, *121*, 4 ff. Nāgarī.
GUJARAT. iv. p. 190, *422*, 5 ff. 1624 A.D.
IO/JE. v. *2942*, 28 ff. Nāgarī; *2943*, 3 ff. Nāgarī.
NU/VK. *818*, 6 ff. Nāgarī. 1791 A.D.; *819*, 5 ff. Nāgarī; *821*, 8 ff. Nāgarī.
PU. ii. *3531*, 20 ff.; *3532*, 5 ff. incomplete.
RAS/BB/HV. *238*, 3 ff. Nāgarī; *239*, 4 ff. Nāgarī; *240*, 11 ff. Nagari. 1823 A.D.
RORI/JM. ii. p. 95, *182*, 18 ff. 18th. century.

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VVRI/VB. p. 77, *5172*, 31 ff. Nāgarī. 1896 A.D; *4743*, 6 ff. Nāgarī. incomplete.

Commentators:
Nṛsiṃha, Viśvanātha and Yogeśvara Daivajña.

Anonymous commentaries:
Tithicintāmaṇi-vyākhyā and *Tithicintāmaṇivyākhyā : kānti.*

Printed text, translations etc.
Tithicintāmaṇi with the commentary by Viśvanātha. Ed. D.V. Apte. Ānandāśrama Sanskrit Series. no. 120. Poona. 1942.

7. *Pātasaṃsādhana* or *Pātasāriṇī*. पातसंसाधन, पातसारिणी

The work contains mainly a number of astronomical tables.

Manuscript reference:
AS/HS & PS. x. *6948*, 19 ff. 1789 A.D.
PU. ii, *3620*, 4 ff. Nāgarī; *3621*, 1 ff. Nāgarī; *3622*, 8 ff. Nāgarī.

Commentators:
Divākara and Viśvanātha.

8. *Pratodayantra*. प्रतोदयन्त्र

A small work in 13 stanzas, describing a special class of astronomical instruments called *pratodayantra*, made of ivory or *śiṃśa* wood. These instruments were in use for speedy measurements of the movements of the heavenly bodies etc. and for the determination of the time. Mitra described it as a chronometer (BIK/RM); and Eggling noted its use in military operations (IO/JE).

Manuscript reference:
BIK/RM. *708*, 3 ff. Nāgarī.
BU/GD. i. *375*, 15 ff. Nāgarī.
CP/FK. p. *232*, *77*, 1 ff.
IO/JE. v. 16 ff. Nāgarī.
NWP. i. p. 520, *42*, 9 ff, Nāgarī.
PU. ii. *3646*, 5 ff. Nāgarī.
RAS/BB/HV. *245*, Nāgarī. 1658 A.D.
RTL/MS. p. 165, 2 ff.

9. *Siddhāntaśiromaṇivyākhyā*. सिद्धान्तशिरोमणिव्याख्या

A commentary on the *Siddhāntaśiromaṇi* (the *Gaṇitādhyāya* and the *Golādhyāya*) of Bhāskarācārya.

Manuscript reference:
ANUP. v. p. 401, *25*, 93 ff.
PU. ii. *4056*, 77 ff. Nāgarī; *4057*, ff. 20-32. Nāgarī. incomplete.

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10. *Sudhīrañjanayantra.* सुधीरञ्जनयन्त्र
A treatise on astronomical instrument in 12 stanzas.
Manuscript reference:
RAS/BB/HV. *245*, Nāgarī.

GAṆEŚA DAIVAJÑA.
Appears to be different from the author of *Grahalāghava.*
Candrasūryagrahaṇagaṇita. चन्द्रसूर्यग्रहणगणित
Manuscript reference:
UJJAIN. p. 51, *11*, 13 ff.

GAṆEŚA DAIVAJÑA.
Appears to be different from the author of *Grahalāghava.*
Jyotiṣaprabodhinī. ज्योतिषप्रबोधिनी
Manuscript reference:
CP/HL. p. 173, *1868.*

GAṆEŚA DAIVAJÑA.
Appears to be different from the author of *Grahalāghava.*
Nakṣatrapaṅkti. नक्षत्रपङ्क्ति
Manuscript reference:
CENSUS. *4681*, 12 ff. Nāgarī.

GAṆEŚA DAIVAJÑA. s.o. Gopala. (1578 A.D.)
Tables on Yogas. It probably represents one of the seven chs. (Yogādhyāya) of *Jātakālaṃkāra* (1613 A.D.)—vide Dvivedi, S. *Gaṇakataraṅgiṇī*, p. 81-82.
Manuscript reference:
CENSUS. *4682*, 12 ff. Nāgarī.

GAṆEŚA SĀṂVATSARA
Tithi-cintāmaṇi. तिथिचिन्तामणि
Manuscript reference:
UJJAIN. p. 51, *2091*, 3 ff. 1828 A.D.

GAṄGĀDĀSA TRIVEDIN
Tithiprakāśa. तिथिप्रकाश
Manuscript reference:
PU. ii. *3537*, 6 ff. Nāgarī.

GAṄGĀDHARA. s.o. Bhairava Datta.
1. *Gaṇitāmṛta.* गणितामृत
A short astronomical work.

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Manuscript reference:
AS/HS & PS. x. *6843*, 4 ff.
GUJARAT. iv. p. 122, *55*, 59 ff.
OUDH. i. p. 120, *77*, 6 ff. Nāgarī.

2. *Grahasāriṇī* or *Khecaraśīghrasiddhi.* ग्रहसारिणी, खेचरशीघ्रसिद्धि
A short astronomical work in 56 stanzas, designed to form an epitome of the *Grahalāghava* of Gaṇeśa Daivajña. It is accompanied by tables.

Manuscript reference:
BM/CB. *458*, 15 ff. Nāgarī. 19th. century; *459*, 13 ff. Nāgarī. 19th. century.

GAṄGĀDHARA. s.o. Govardhana and grandson of Divākara of Jambūsaronagara (c. 1420 A.D.)

Gaṇitāmṛtasāgarī or *Amṛtasāgarī* or *Līlāvatīpāṭīkaṭīkā.* गणितामृतसागरी, अमृतसागरी, लीलावतीपाटीकटीका
A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:
ANUP. iv. p. 386, *694*, 113 ff. 1654 A.D.
AS/KBK. p. 168, Bengali.
BERLIN. i. *831*, 109 ff. Bengali; ii. part i. *1739*, 53 ff. 1641 A.D.
GUJARAT. iv. p. 154, *230*, 36 ff. 1643 A.D.
IO/JE. v. *2806*, 61 ff. Bengali; *2807*, 47 ff. Nāgarī; *2808*, 13 ff. Nāgarī. 1780 A.D. incomplete.
LEIPZIG/TA. *961*, 42 ff, c. 1676 A.D. Lacks beginning.
NOTICES/RM. viii. *1254*, 68 ff. Bengali.
NWP. v. p. 88, 80 ff. Nāgarī.
OUDH (1890). p. 126, *149*, 62 ff. Nāgarī.
RAS/BB/HV. *272*, 42 ff. Nāgarī. incomplete.
VVRI/VB. p. 80, *3664*, 56 ff. Nāgarī. 1726 A.D. incomplete; *2665*, 32 ff. Nāgarī.

GAṄGĀDHARA. s.o. Nārāyaṇa of Tapar, near Daulatābād. (c. 1586 A.D.)

Manoramā. मनोरमा
A commentary on the *Grahalāghava* of Gaṇeśa Daivajña.

Manuscript reference:
BU/GD. i. *346*, 10 ff. Nāgarī.
GUJARAT. iv. p. 128, *82*, 49 ff. 1769 A.D.
PU. ii. *3368*, 37 ff. Nāgarī.

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GAṄGĀDHARA.

Pañcasiddhāntamata or *Bhāsvatyudāharaṇa* पञ्चसिद्धान्तमाता भास्वत्युदाहरण

A commentary on the *Bhāsvatī* of Śatānanda.

Manuscript reference:

OUDH. xiv. p. 48.

RORI/JM. ii. p. 100, *263*, 12 ff. 1892 A.D.

GAṄGĀDHARA. s.o. Candrabhaṭṭa. (1434 A.D.)

Cāndramāna. चान्द्रमान

An astronomical tract based on the *Sūryasiddhānta.* The tract is divided into the following 7 chs. (i) Kālamīmāṃsādhyāya, (ii) Māsadhruvamadhyagrahādhikāra, (iii) Ravīndusphuṭikaraṇatithyadhikāra, (iv) Māsadhruvādhikāra, (v) Sauramānādhyāya, (vi) Madhyamādhikāra, and (vii) Spaṣṭādhikāra. The work is described by Sudhākara Dvivedin in his *Gaṇakataraṅgiṇī*, p. 50-52, only one dilapidated Ms. being reported in Benares.

GAṄGĀDHARA.

Kātyāyana-śulbabhāṣya. कात्यायनशुल्वभाष्य

It is a commentary on the *Śulbasūtra* of Kātyāyana.

Manuscript reference:

BANARAS/JU & SJ. p. 374, *4098*, 69 ff. Nāgarī.

PU. i. p. 134, *51*, 65 ff.

GAṄGĀDHARA VARMAN.

Grahalāghavasāriṇī. ग्रहलाघवसारिणी

Manuscript reference:

PU. ii. *3369*, 6 ff. Nāgarī. 1688 A.D.

Printed text, translations etc.

Grahalāghavasāriṇī, with Hindi explanation and tables. Sri Veṅkaṭeśwara Press. Bombay, 1911.

GAṄGĀRĀMA.

Tithinirṇaya. तिथिनिर्णय

Manuscript reference:

CENSUS. *3100*, 29 ff. 1610 A.D.

Gaṇita. गणित

An anonymous work on arithmetic.

Manuscript reference:

ANUP. iv. p. 346, *5*, 3 ff.

TAYLOR. i. p. 523, *1375.*

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Gaṇitabhūṣaṇavyākhyā. see MAKKI BHAṬṬA.

Gaṇitacintāmaṇi. see DIVĀKARA s.o. Nṛsiṃha.

Gaṇitacūḍāmaṇi. see HARIHARA s.o. Āśādhara.

Gaṇitādarśa. see DHARMAPĀṬHIN.

Gaṇitādhyāya. see BHĀSKARĀCĀRYA.

Gaṇitādhyāyaṭīkā. see RĀMAKṚṢṆA s.o. Lakṣmaṇa.

Gaṇitagrantha. गणितग्रन्थ

An anonymous work on arithmetic dealing with commercial accounts with examples.

Manuscript reference:
MADRAS/D. Supplement. xxx, *16787*, 5 ff. Grantha.
MADRAS/T. vol. vi. part i. Sanskrit, *5151(C)*, ff. 5b-8a. Grantha. 1925-26 A.D.
TAYLOR. i. p. 525, *1649*; *1643*.

Gaṇitakaraṇa. see RAGHUNĀTHA.

Gaṇitakaumudī. see NĀRĀYAṆA PAṆḌITA s.o. Nṛsiṃha Daivajña.

Gaṇitalīlāvatī. गणितलीलावती

An anonymous arithmetical work.

Manuscript reference:
RORI/JM. ii. *4771(I)*, ff. 541-545. 1805 A.D.

Gaṇitamañjarī. गणितमञ्जरी

An anonymous work on arithmetic.

Manuscript reference:
NWP. x. p. 51, *28*, 33 ff. Nāgarī.

Gaṇitamañjarī. see GAṆEŚA. s.o. Ḍhuṇḍhirāja.

Gaṇitāmṛta. see ABBAYA KAVI.

Gaṇitāmṛta. see BHŪPATI.

Gaṇitāmṛta. see GAṄGĀDHARA. s.o. Bhairava Datta.

Gaṇitāmṛtakūpikā. see RĀMACANDRA.

Gaṇitāmṛtakūpikā. see SŪRYADĀSA. s.o. Jñānarāja.

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Gaṇitāmṛtalaharī. see RĀMAKṚṢṆA s.o. Lakṣmaṇa.
Gaṇitāmṛtasāgarī. see GAṄGĀDHARA s.o. Govardhana.
Gaṇitāmṛtasāgarī. see SŪRAJI
Gaṇitāmṛtasāriṇī. see DIVĀKARA.
Gaṇitāmṛtavarṣiṇī. see SŪRYAMAṆI s.o. Tripāṭhī Ghanaśyāma.
Gaṇitanāmamālā. see HARIDATTA s.o. Śrīpati.

Gaṇitapadī. गणितपदी
An anonymous arithmetical work.
Manuscript reference:
GUJARAT. iv. p. 122, *51*, 8 ff.

Gaṇitapañcaviṃśaṭīkā. see ŚAMBHUDĀSA.

Gaṇitaprakāśikā. गणितप्रकाशिका
An anonymous alphabetical list of mathematical terms with meaning in Telugu.
Manuscript reference:
MADRAS/D. xxiv, *13407*, 10 ff. Telugu.

Gaṇitaracanāmañjarī. see GAṆEŚA. s.o. Ḍhuṇḍhirāja.
Gaṇitarāja. see KEVALARĀMA PAÑCĀNANA.
Gaṇitarāja. see PAÑCĀNANA.
Gaṇitārṇava. see NĀMANĀRYA.

Gaṇitārṇava-ravicandrapadakāni. गणितार्णवरविचन्द्रपदकानि
An anonymous astronomical tables of calculation in relation to the movement of sun and moon etc.; contains *ravicakra* and *candracakra.*
Manuscript reference:
MADRAS/T. vol. iii. part i. Sanskrit B, *2602(a)*, ff. 1a-13b, Telugu.

Gaṇitasaṃgraha. गणितसंग्रह
An anonymous work on arithmetic.
Manuscript reference:
MAC/HW. p. 169, *53*, Kanarese.
MADRAS/T. vol. iv. part i. Sanskrit; *3943 (i)*, ff. 60a-64b. Grantha.
OPPERT. i. *1433.*

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Gaṇita-saṃgraha. see YALLĀCĀRYA.
Gaṇitasāra. see ŚAMBHUNĀTHA.
Gaṇitasāra. see ŚRĪDHARĀCĀRYA.
Gaṇitasārasaṃgraha. see MAHĀVĪRĀCĀRYA.
Gaṇitasārasaṃgraha-vyākhyā. see VARADĀRĀJA.

Gaṇitasāroddhāra. गणितसारोद्धार
An anonymous astronomical work on finding out the exact position of the heavenly bodies.
Manuscript reference:
NWP. i. p. 574, *188*, 6 ff. Nāgarī; p. 578, *200*, 6 ff. Nāgarī.

Gaṇitasāroddhāra. see ĀNANDA MUṆI.
Gaṇitaśāstra. see MAHĀRĀJA.
Gaṇitaśāstra. see MALLAYA.
Gaṇitaśāstra. see ŚRĪRĀJĀDITYA.
Gaṇitaskandha. see VṚDDHA VĀŚIṢṬHA.

Gaṇitasūtra. गणितसूत्र
An anonymous work on arithmetic.
Manuscript reference:
JSB/SD. p. 8, *179*, 1 ff. Kanarese.

Gaṇitatattvacintaṃaṇi. see DIVĀKARA
Gaṇitatattvacintāmaṇi. see LAKṢMĪDĀSA s.o. Vācaspati Miśra.
Gaṇitatilaka. see ŚRĪPATI s.o. Nāgadeva.

Gaṇitaviṣaya. गणितविषय
An anonymous astronomical work with tables and charts.
Manuscript reference:
MADRAS/T. vol. x. Sanskrit A, *6354*, 19 ff. Telugu.

Gaṇitayuktibhāṣā or *Yuktibhāṣā.* गणितयुक्तिभाषा, युक्तिभाषा
c. 1475-1575 A.D.
An anonymous treatise in Malayalam on arithmetic and mensuration, being an exposition on Nīlakaṇṭha's *Tantrasaṃgraha*. The work is divided into the following 7 chs. (i) Parikarmāṣṭaka, (ii) Daśapraśnottara, (iii) Bhinnagaṇita, (iv) Trairāśika, (v) Kuṭṭakāra, (vi) Paridhivyāsaprakaraṇa, (vii) Jyānayanaprakāra. The book contains, among others, an

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exposition of the trigonometrical series (for π and Sine and Cosine power), as developed in the *Tantrasaṃgraha*, *Karaṇapaddhati* and other works.

Manuscript reference:

MADRAS/T. vol. v. part i. Sanskrit B, *4382*, 140 ff. Nāgarī. 1923-24 A.D.

Printed text, translations etc.

Yuktibhāṣā Part I. Ed. with notes by Ramavarma (Maru) Tampuran and A. R. Akhilesvara Iyer, Mangalodayam Press. Trichur. 1948.

Study:

MARAR, K. AND RAJAGOPAL, C. T. 'On the Hindu Quadrature of the Circle', *JBBRAS*, **20,** 65-77, 1944.

RAJAGOPAL, C. T. 'A neglected chapter of Hindu Mathematics', *SM*, **15,** nos. 3-4, 201-209, 1949.

RAJAGOPAL, C. T. AND AIYAR, T. V. VEDAMURTHI. 'On the Hindu proof of Gregory's Series', *SM*, **17,** nos. 1-2, 65-74, 1951.

RAJAGOPAL, C. T. AND VENKATARAMAN, A. 'The Sine and Cosine Power series in Hindu Mathematics (with an addendum by K. M. George), *JASB*, 3rd. Series, **15,** 1-13, 1949.

SARASWATI, T. A. ' The development of mathematical series in India after Bhāskara II', *BNISI*, no. 21, 320-43, 1963.

SARMA, K. V. 'Jyeṣṭhadeva and his identification as the author of *Yuktibhāṣā*?' f 19th. session of All India Orienta Conference, University of Delhi, 1957.

WHISH, C. M. 'On the Hindu Quadrature of the circle and the infinite series of the proportion of the circumsference to the diameter exhibited in the four Śāstras, the *Tantrasaṃgraha*, *Yuktibhāṣā*, *Karaṇapaddhati* and *Sadratnamālā*,' *TASGBI*, **3,** 509-23, 1835.

Gaṇividyāpaṇatti. गणीविद्यापणत्ति

An anonymous Jaina work on mathematics.

Manuscript reference:

AS/KBN, *7498.*

GĀRGYA

1. *Candracchāyāgaṇita.* चन्द्रच्छायागणित

An astronomical work dealing mainly with the movements of the sun and the moon.

Manuscript reference:

MADRAS/T. vol. vi. part i. Sanskrit, *5185(b)*, ff. 26a-35b. 1925-26 A.D.

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2. *Candracchāyāgaṇitaṭīkā.* चन्द्रच्छायागणितटीका

Manuscript reference:
MADRAS/T. vol. vi. part i. Sanskrit *5185(b)*, ff. 26a-35b. 1925-26 A.D.

GAURĪŚVARA.

Grahadarpaṇa. ग्रहदर्पण
An astronomical work based on the *Sūryasiddhānta.*

Manuscript reference:
NEPAL/HS. i. p. 166, *1412*, 12 ff. Nāgarī.

GIRIDHĀRI MIŚRA.

Dṛggolavarṇana. दृग्गोलवर्णन
A short description of heavenly bodies.

Manuscript reference:
NWP. i. p. 520, *4Î*, 2 ff. Nāgarī.

COMPLIMENTARY

Gīrnādi-vākya. see VARARUCI.

GOKULANĀTHA DAIVAJÑA.

Makarandopapatti or *Pañcāṅgopapatti* or *Makaranda-vāsanā.* मकरन्दोपपत्ति, पञ्चाङ्गोपपत्ति, मकरन्दवासना
An exposition of Makaranda's *Tithipatra.*

Manuscript reference:
BORS/AB. iii. *249*, 53 ff. Maithili.
PU. ii. *3612*, 25 ff. Nāgarī.

Printed text, translations etc.
Makarandopapatti, ed. by Banarasi Prasad. Benares Sanskrit Press, Benares. 1882 A.D.

Goladarpaṇa. गोलदर्पण
An anonymous work.

Manuscript reference:
CP/FK. p. 226, *20*, 25 ff.

Golādhyāya. see BHĀSKARĀCĀRYA.
Goladīpikā. see PARAMEŚVARA.
Goladīpikā-vivṛti. see PARAMEŚVARA.
Golānanda. see CINTĀMAṆI S.O. Vināyaka Somayājin.
Golaprakāśa. see NĪLĀMBARA JHĀ.
Golasaṃsthāna. see PARAMEŚVARA.

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Golasāra. see NĪLAKAṆṬHA SOMASUTVAN.

Golaśāstra. गोलशास्त्र

An anonymous astronomical work.

Manuscript reference:

VVRI/VB. *6252*, 60 ff. Grantha.

Golavarṇana. गोलवर्णन

An anonymous work.

Manuscript reference:

BANARAS. p. 266, *135*, ff. 1-70, 1754 A.D.

Goloddeśa. see DĀMODARA.

GOPĀLAYAJVĀ.

Āpastamba-savyākhyā. आपस्तम्बसव्याख्या

It is a commentary on the *Śulbasūtra* of Āpastamba.

Manuscript reference:

AS/HS. p. 491, *556*, 30 ff. Nāgarī. complete.
PU. i. p. 40, *96*, ff. 22-90, 1789 A.D.
VVRI/VB. p. 74, *13*, 22 ff. Nāgarī.

GOPARĀJA PAṆḌITA or Gopīrāja Paṇḍita.

1. *Grahagaṇita-kalpataru* or *Kalpataru.*
ग्रहगणितकल्पतरु, कल्पतरु

An astronomical work in 14 chs.

Manuscript reference:

ANUP. iv. p. 347, *117*, 40 ff. 1607 A.D.; *118*, 86 ff.
BIK/RM. *605*, 225 ff. Nāgarī.

2. *Grahagaṇitakalpataru-vāsanābhāṣya.*
ग्रहगणितकल्पतरु-वासनाभाष्य

A commentary on the above work.

Manuscript reference:

ANUP. iv. p. 347, *119*, 224 ff.; *120*, 50 ff. incomplete.
BIK/RM. *665*, 225 ff. Nāgarī.

GOPĪNĀTHA.

Sūrya-pakṣa-śaraṇa-vyākhyā. सूर्यपक्षशरणव्याख्या

A commentary on the *Sūrya-pakṣa-śaraṇa* of Viṣṇu Daivajña.

Manuscript reference:

PU. ii. *4066*, 36 ff. Nāgarī. 1777 A.D.

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GOPĪNĀTHA SUDHĪ

Bhāsvatī-prakāśikā. भास्वतीप्रकाशिका

A commentary on the *Bhāsvatī* of Śatānanda.

Manuscript reference:

IO/JE. v. *2919*, ff. 36-50a. Nāgarī. 1811 A.D.
OUDH (1890). p. 116, *60*, 62 ff. Nāgarī.
RTL/MS. p. 167, 22 ff.

GOPĪRĀJA.

Yantrarāja-ṭīkā. यन्त्रराजटीका

A commentary on the *Yantrarāja* of (?)

Manuscript reference:

ANUP. iv. p. 379, *606*, 134 ff. end missing; p. 380, *607*, 122 ff. end missing.

GOSVĀMĪ

Tithi-lalla. तिथिलल्ल

Manuscript reference:

GUJARAT. iv. p. 148, *188*, 4 ff.

GOVINDA

Jyotiṣa-ratna-saṃgraha. ज्योतिषरत्नसंग्रह

Manuscript reference:

PU. ii. *3473*, 93 ff. Nāgarī. 1625 A.D.

GOVINDA s.o. Viśvanātha.

Karaṇaprakāśa-vivṛti. करणप्रकाशविवृति

A commentary on the *Karaṇaprakāśa* of Brahmadeva. Gaṇaka.

Manuscript reference:

BU/GD. i. *339*, 12 ff. Nāgarī. incomplete. chs. 1 & 2 only.

GOVINDA MIŚRA

Bhāsvatī-vyākhyā. भास्वतीव्याख्या

A commentary on the *Bhāsvatī* of Śatānanda.

Manuscript reference:

FSM/TA. p. 83, *257*, 31 ff. 1813 A.D.

GOVINDA PAṆḌITA.

Jyotiṣa-ratna. ज्योतिषरत्न

Manuscript reference:

CP/HL. p. 173, *1871*.
GUJARAT. iv. p. 140, *146*, 38 ff. 1611 A.D.

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GOVINDA SVĀMIN

Mahābhāskarīya-bhāṣya. महाभास्करीयभाष्य

A commentary on the *Mahābhāskarīya* of Bhāskara 1.

Manuscript reference:

TRI/KS. iv, *903*, 47 ff. Malayalam. 16th. century. incomplete; *943*, 30 ff. Malayalam; *977*, 143 ff. Malayalam.

Printed text, translations etc.

Mahābhāskarīya with the *Bhāṣya* of Govindasvāmin and *Siddhāntadīpikā* of Parameśvara. Ed. by T. S. Kuppanna Sastri, Government Oriental Mss. Library, Madras, 1957.

Grahabhāṣya. ग्रहभाष्य

An anonymous astronomical work.

Manuscript reference:

MADRAS/D. xxiv, *13416*, 6 ff. Telugu.

Grahabhāvādhyāya. see VIJAYANĀTHA.

Grahabhramaka. ग्रहभ्रमक

An anonymous work.

Manuscript reference:

UDAIPUR. p. 42, *1436*.

Grahacakravivaraṇa. see KṚṢṆARATHA.

Grahacandrikā-gaṇita. see APPAYA s.o. Marla Perubhaṭṭa.

Grahacāra. ग्रहचार

An anonymous astronomical work explaining the movements of the sun and the planets with reference to the zodiacal signs.

Manuscript reference:

BN/AC. i. *960*, 103 ff. Grantha.
TRI/KS. iii. *873*, 112 ff. Malayalam.

Grahacāra. see KEVALARĀMA PAÑCĀNANA

Grahacāraṭīkā. see RĀMAKIṄKARA BHAṬṬĀCĀRYA.

Grahacarita. see KEVALARĀMA PAÑCĀNANA.

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Grahacāranibandhana. ग्रहचारनिबन्धन

An anonymous astronomical treatise for calculating certain details relating to *tithi* and *Nakṣatras*. Some authorities ascribed this work to Haradatta.

Manuscript reference:

MADRAS/T. vol. v. part i. Sanskrit C. *4465(C)*. ff. 247a-254b. Grantha.

Printed text, translations etc.

Grahacāranibandhana. Published by K. V. Śarmā, K. S. R. Institute, Madras-4, 1954.

Grahadarpaṇa. see GAURĪŚVARA.

Grahādarśapatra. see NIDHIMIŚRA DAIVAJÑA.

Grahadīpikā. see DAYĀŚAṂKARA.

Grahadīpikā. see NṚSIṂHA DAIVAJÑA s.o. Rāma Daivajña.

Grahadīpikā. see SUNDARARĀJA.

Grahāgama. ग्रहागम

An anonymous astronomical work. The author is the son of one Govinda.

Manuscript reference:

BM/CB. *470*, 1 ff.

Grahāgamakutūhala. see BHĀSKARĀCĀRYA.

Grahagaṇita. see ĀŚĀDHARA GAṆAKA.

Grahagaṇita-cintāmaṇi. see CINTĀMAṆI s.o. Jñānarāja.

Grahagaṇita-kalpataru. see GOPARĀJA PAṆḌITA.

Grahagaṇita-kalpataru-vāsanābhāsya. see GOPARĀJA PAṆḌITA.

Grahagocara. see JAYARĀMA.

Grahagolatattva. see KAMALĀKARA s.o. Nṛsiṃha.

Grahajñāna. see ĀŚĀDHARA GAṆAKA.

Grahakalpataru. see RAGHUNĀTHA.

Grahakaumudī. see NṚSIṂHA DAIVAJÑA s.o. Rāma Daivajña.

Grahakauśala. see ŚAMBHU s.o. Kamalanayana Śaṇḍa.

Grahakautuka. see KEŚAVA DAIVAJÑA s.o. Kamalākara.

Grahakautuka. see NĪLAKAṆṬHA JYOTIRVID s.o. Ananta.

Grahakautukodāharaṇa. see VIŚVANĀTHA.

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Grahakoṣṭhaka. ग्रहकोष्ठक
An anonymous work.
Manuscript reference:
GUJARAT. iv. p. 124, *62*, 150 ff.
RAS/BB/VM. p. xlv. 24 ff.

Grahalāganisāraṇī. ग्रहलागनिसारणी
An anonymous astronomical work.
Manuscript reference:
IO/JE. v. *2790*, 8 ff. Nāgarī. 1750 A.D.

Grahalāghava. see GAṆEŚA DAIVAJÑA. s.o. Keśava Daivajña.

Grahalāghava. see KEŚAVA.

Grahalāghava. see NĪLAKAṆṬHA JYOTIRVID s.o. Ananta.

Grahalāghava. see ṬRYAMBAKA BHAṬṬA.

Grahalāghavabhāṣya. see MAYADĀNAVA.

Grahalāghavakaraṇa. see SUDHĀKARA DVIVEDIN.

Grahalāghava-laghusāraṇikā. see PREMA DAIVAJÑA.

Grahalāghavasāraṇī. see NĪLAKAṆṬHA.

Grahalāghavasāraṇī. see PREMA DAIVAJÑA.

Grahalāghavasāraṇī. see GAṄGĀDHARA VARMAN.

Grahalāghavasāriṇī. ग्रहलाघवसारिणी
An anonymous astronomical work.
Manuscript reference:
PU. ii. *3370*, 14 ff. Nāgarī; *3371*, 25 ff. Nāgarī. 1782 A.D.
VVRI/VB. *1567*, 22 ff. Nāgarī.

Grahalāghava-siddhānta-rahasyodāharaṇa. see VIŚVANĀTHA DAIVAJÑA. s.o. Divākara Daivajña.

Grahalāghava-siddhāntarahasyodāhṛti see NĀRĀYAṆA Daivajña.

Grahalāghavaṭīkā. see BĀLAGOVINDA.

Grahalāghavaṭīkā. see MALLĀRI s.o. Divākara.

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Grahalāghava-ṭīkā. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

Grahalāghava-vivaraṇa. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

Grahalāghavavivṛti. see GAṆEŚA DAIVAJÑA s.o. Keśava Daivajña.

Grahalāghavavṛtti. see VIŚVANĀTHA DAIVAJÑA.

Grahalāghava-vyākhyā. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

Grahalāghava-vyākhyāna. see KEŚAVA DAIVAJÑA.

Grahalāghavodāharaṇa. see MAHĀDEVA.

Grahalāghavodāharaṇa. see VIŚVANĀTHA DAIVAJÑA. s.o. Divākara Daivajña.

Grahalāghavodāharaṇa. ग्रहलाघवोदाहरण 1822 A.D.

An anonymous commentary on the *Grahalāghava* of Gaṇeśa Daivajña.

Manuscript reference:

BORS/AB. iii, *58*, 20 ff. Maithili. 1847 A.D.

Grahalakṣaṇa ग्रहलक्षण

An anonymous astronomical work.

Manuscript reference:

M & C/LR. *279*, Telugu.

Grahamaṇi. see ḌHUṆḌHIRĀJA s.o. Nṛsiṃha.

Grahamañjarī. ग्रहमञ्जरी

An anonymous astronomical treatise in three chapters, *viz.*, (i) Madhyādhikāra, (ii) Madhyaśīghrasādhanādhikāra, (iii) Astronomical tables.

Manuscript reference:

TCC/TA. p. 58, 4 ff. Bengali. 17th. century; p. 59, 32 ff. Nāgarī. 1770 A.D.

Grahaṇa. see MALLĀRI s.o. Divākara.

Grahaṇadarpaṇa. ग्रहणदर्पण

An anonymous astronomical work.

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Manuscript reference:
NWP. ix. p. 50, *28*, 14 ff. Nāgarī.
OPPERT. ii. *1963*.

Grahaṇādarśa. see BUDHA SIṂHA.

Grahaṇādhikāra. see TAMMAYA.

Grahaṇadvayādhikāra. see TAMMAYA.

Grahanakṣatracakra. ग्रहनक्षत्रचक्र
An anonymous astronomical work.

Manuscript reference:
PU. ii. *3347*, ff. 2-6, Bengali.

Grahaṇalikhanānukrama. see NĀRĀYAṆA s.o. Rāma.

Grahaṇamālā. ग्रहणमाला
An anonymous astronomical work on the eclipses of the sun and the moon.

Manuscript reference:
AS/HS & PS. x. *6849*, 69 ff. Nāgarī. 19th. century; *6850*, 8 ff. Nāgarī. 1834 A.D.
PU. ii. *3340*, 9 ff. Nāgarī; *3342*, 30 ff. Nāgarī.

Grahaṇamālā. see HEMĀṄGADA ṬHĀKURA.

Grahaṇamaṇḍana. ग्रहणमण्डन
An anonymous astronomical work. Parameśva wrote a work bearing the same title.

Manuscript reference:
TRI/TG. i. p. 135, Malayalam.

Grahaṇa-mukura. see VIDVĀNĀCĀRYA s.o. Mallappa.

Grahaṇa-nirṇaya. ग्रहणनिर्णय
An anonymous astronomical work.

Manuscript reference:
BN/AC. i. *1005*, Nāgarī. 18th century.
PU. ii. *3339*, 5 ff. Nāgarī.
TANJORE/AB. p. 76, 4 ff. Nāgarī.

Grahaṇapaddhati. see NANDARĀMA MIŚRA.

Grahaṇapañcāṅga. ग्रहणपञ्चाङ्ग
An anonymous astronomical work.

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Manuscript reference:
GUJARAT. iv. p. 124, *65*, 20 ff. 1846 A.D.

Grahaṇa-parilekhana. ग्रहणपरिलेखन

An anonymous astronomical work. It gives a diagram of lunar eclipse in 1590 A.D.

Manuscript reference:
ANUP. iv. p. 347, *26*, 1 ff.

Grahaṇa-parvabodha. ग्रहणपर्वबोध

An anonymous astronomical work dealing with solar and lunar eclipses.

Manuscript reference:
AS/HS & PS. x. *6854*, 2ff. Nāgarī.

Grahaṇaparvadvayadīpa. see KĀŚĪRĀJA.

Grahaṇārthaprakāśikā. see VIŚVANĀTHA DAIVAJÑA S.O. Divākara Daivajña.

Grahaṇasambhavādhikāra. see PADMANĀBHA.

Grahaṇāṣṭaka. see PARAMEŚVARA.

Grahaṇāvalī. ग्रहणावली

An anonymous astronomical work dealing with solar and lunar eclipses.

Manuscript reference:
AS/HS & PS. x. *6851*, 8 ff. Nāgarī. 18th. century.

Grahaṇavicāra. ग्रहणविचार

An anonymous astronomical work.
PU. ii. *3343*, 6 ff. Nāgarī.

Grahaṇaviṣaya. ग्रहणविषय

An anonymous astronomical work.

Manuscript reference:
VVRI/VB. *261*, 5 ff. Nāgarī; *2069*, 5 ff. Malayalam.

Grahanighaṇṭu. ग्रहनिघण्टु

An anonymous astronomical work.

Manuscript reference:
MADRAS/D. xxiv. *13654*, 2ff. Telugu.
MADRAS/T. vol. i. part i. Sanskrit A, *1271(a)*, 1 ff. Telugu; vol. iii. part i. Sanskrit B, *2533(o)*; vol. iv. part i. Sanskrit C, *3943(n)*, Grantha.

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Grahaparivṛttivyākhyā. ग्रहपरिवृत्तिव्याख्या
An anonymous astronomical work.
Manuscript reference:
TRI/KS. i. *136*, Malayalam.

Grahapīṭhamālā. see ĀPADEVA.

Grahaprabodha. see NĀGEŚA DAIVAJÑA.

Grahaprabodha. see ŚIVA DAIVAJÑA.

Grahaprabodha-sāriṇī. see YĀDAVA.

Grahaprabodhasāriṇī. ग्रहप्रबोधसारिणी
An anonymous astronomical work.
Manuscript reference:
IO/JE. v. *2969*, 37 ff. Nāgarī. 1750 A.D.

Grahaprabodhaṭīkā. see NĀGEŚA DAIVAJÑA.

Grahaprabodha-udāharaṇa. ग्रहप्रबोध-उदाहरण
An anonymous astronomical commentary on the *Grahaprabodha* of Nāgeśa Daivajña.
Manuscript reference:
RAS/BB/VM. p. xlv. 11 ff.

Grahapradīpa. ग्रहप्रदीप c. 1365 A.D.
An anonymous astronomical treatise based on the *Āryasiddhānta*, in 6 chapters, *viz.*, (i) Tithyadhikāra, (ii) Bhaumādispaṣṭīkaraṇa (iii) Vakramāgoudayāstādhikāra, (iv) Chāyādhikāra, (v) Candragrahaṇa and (vi) Sūryagrahaṇa.
Manuscript reference:
BU/GD. i. *342*, 6 ff, Nāgarī.

Grahaprakāśa. see DEVADATTA. s.o. Nāgeśa.

Grahaprakāśa. see RĀMADAYĀLU s.o. Yaśavanta.

Grahaprakāśaṭīkā. see DEVADATTA s.o. Nāgeśa.

Grahaprakāśīkaraṇa. see RĀMADAYĀLU s.o. Yaśavanta.

Grahasāriṇī. ग्रहसारिणी
An anonymous astronomical table on the *Grahajñāna* of Āśādhara Gaṇaka.
Manuscript reference:
BU/GD. i. *350*, 2 ff. Nāgarī.
IO/JE. v. *2923*, 5 ff. Nāgarī. 1650 A.D. Based on *Grahajñāna* of Āśādhara.

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NWP. i. p. 574, *187*, 10 ff. Nāgarī. On position of stars.
OUDH. (1890). p. 118, *70*, 19 ff. Nāgarī. On position of planets.
PU. ii. *3372*, 22 ff. Śāradā; *3373*, 6 ff. Nāgarī.

Grahasāriṇī. see GAṄGĀDHARA s.o. Bhairava Datta.

Grahasāriṇī. see KAMALĀKARA s.o. Nṛsiṃha.

Grahasāriṇī. see MALLĀRI s.o. Divākara.

Grahasiddhi. see MAHĀDEVA.

Grahasiddhi. see MAHĀDEVA BHAṬṬA s.o. Paraśurāma.

Grahaspaṣṭīkaraṇa-koṣṭhaka. see MAHĀDEVA.

Grahasphuṭa. ग्रहस्फुट

An anonymous astronomical work helpful for finding out the exact position of each of the nine planets on a specified day.

Manuscript reference:
MADRAS/D. xxiv, *13419*, 3 ff. Telugū.

Grahasphuṭānayana. ग्रहस्फुटानयन

An anonymous astronomical work.

Manuscript reference:
PU. ii, *3374*, 1 ff. Nāgarī.

Grahasvarūpa. see TRYAMBAKA BHAṬṬA.

Grahatantra. see AHOBILANĀTHA.

Grahatantra-vivaraṇa. see VEṄKAṬA YAJVĀ s.o. Tirumala Yajvā.

Grahatilaka. ग्रहतिलक

An anonymous astronomical work.

Manuscript reference:
GUJARAT. iv. p. 126, *68*, 3 ff. 1660 A.D.

Grahavidyādhara. see VIDYĀDHARA.

Grahavinoda. see SŪRYA

Grahayāmala. ग्रहयामल

An anonymous astronomical work.

Manuscript reference:
BN/AC. i, *961(i)*, Bengali. 19th. century.

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Gūḍhārthadīpikā. see MĀMIḌI ŚIṄGAYA.

Gūḍhārthaprakāśikā. see RAṄGANĀTHA s.o. Ballāla.

GUṆARATNA SŪRI.

Avacārṇi or *Kṣetrasamāsāvacūri.* अवचूर्णि, क्षेत्रसमासावचूरि

A commentary on the *Kṣetrasamāsa* of Somatilaka Sūri.

Manuscript reference:

NOTICES/RM. viii, *2653*, 28 ff. Nāgarī.
RORI/JM. ii. 32 ff. 16th. century.

HARADATTA.

Daivajñabāndhava. दैवज्ञबान्धव

A treatise for the preparation of calendars.

Manuscript reference:

AS/HS & PS. x, *6877*, 22 ff. Nāgarī. 1846 A.D.

N.B. *Grahacāraṇanibandhana* described as an anonymous work has been ascribed to one Haradatta by Śrī K. V. Śarmā. It is to be ascertained whether this work was composed by the author of *Daivajñabāndhava.* (see *Grahacāranibandhana.*)

HARAKARṆA.

Makarandapaddhati. मकरन्दपद्धति

An anonymous astronomical work.

Manuscript reference:

PU. ii. *3766*, 3 ff. Nāgarī. 1860 A.D.

Hārāvalīkośa. see PURUṢOTTAMA DEVA.

HARIBHADRA SŪRI. (c. 1128 A.D.)

Laghukṣetrasamāsavṛtti. लघुक्षेत्रसमासवृत्ति 1128 A.D.

A commentary on the *Laghukṣetrasamāsa.*

Manuscript reference:

GOS/21. p. 35, *268(i)*, 26 ff.

HARIḌATTA s.o. Śrīpati.

1. *Gaṇita-nāmamālā* or *Jyotiṣīnāmamālā.* गणितनाममाला, ज्योतिषीनाममाला

An astronomical treatise containing a glossary of astronomical technical terms.

Manuscript reference:

ANUP. iv. p. 357, *79*, 3 ff.

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AS/HS & PS. x. *6844*, 14 ff. Nāgarī. 1822 A.D.; *6845*, 3 ff. Nāgarī. 18th century.
BORS/AB. iii, *40*, 7 ff. Maithili.
CENSUS. *4796*, 6 ff. Nāgarī. 1764 A.D.
GUJARAT. iv. p. 122, *49*, 7 ff. 1739 A.D.
IO/JE. v. *2975*, 4 ff. Nāgarī. 1600 A.D.
NOTICES/RM. viii. *2731*, 8 ff. Nāgarī.
PU. ii. *3325*, 8 ff. Nāgarī.
RORI/JM. ii. *4392*, 4 ff. 18th. century; *7111*, 6 ff. 18th century; *6764*, 8 ff. 1906 A.D.

Printed text, translations etc.
Printed in *Dvādaśakoṣa-saṃgraha*, Benaras. 1865.

2. *Parahita.* परहित
An astronomical treatise dealing with planetary movements. These movements are described from the परहित point of view. The introduction of this work is styled 'Grahacāranibandhana.

Manuscript reference:
TRI/KS. iii, *891*, 4 ff. Malayalam.

HARIHARA s.o. Āśādhara.

1. *Gaṇitacūḍāmaṇi* or *Vāsanāsarvasva.* गणितचूडामणि, वासनासर्वस्व 1599 A.D.
An astronomical treatise on planetary motions.

Manuscript reference:
IO/JE. v. *2924*, 13 ff. Nāgarī. 1599 A.D.

2. *Siddhāntaśiromaṇivyākhyā.* सिद्धान्तशिरोमणिव्याख्या
A commentary on the *Siddhāntaśiromaṇi* of Bhāskarācārya.

Manuscript reference:
NWP. v. *16*, 15 ff. Nāgarī.

HARIKARṆA s.o. Sundara Śarman.

1. *Bālaprabodha* or *Bālabodha.* वालप्रबोध, वालबोध 1612 A.D.
A short astronomical tract dealing mainly with calculations. It has 5 chs. *viz.*, (i) Tithyadhikāra, (ii) Mesārkasādhanādhikāra, (iii) Madhyamādhikāra, (iv) Grahaspaṣṭādhikāra, (v) Grahāṇāmudayāstādhikāra.

Manuscript reference:
BU/GD. *363*, 5 ff. Nāgarī.
RORI/JM. ii, *7112*. 18th. century.

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2. *Tithyādipatra-vyākhyā.* तिथ्यादिपत्रव्याख्या
A commentary on *Tithyādipatra* of Makaranda.
Manuscript reference:
BM/CB. *474*, 10 ff. Jain. 18th. century.

HARIKṚṢṆA.
Dhīkoṭīṭīkā. धीकोटीटीका
A commentary on the *Dhīkoṭīkaraṇa* of Śrīpati.
Manuscript reference:
VVRI/VB. *2454*, 4 ff. Nāgarī. 1793 A.D.; *2646*, 7 ff. Nāgarī. 1793 A.D.

HARIŚAṄKARA.
Yantracintāmaṇi-dīpikā. यन्त्रचिन्तामणिदीपिका
A commentary on the *Yantracintāmaṇi* of Cakradhara.
Manuscript reference:
NWP. i. p. 522, *51*, 13 ff. Nāgarī.

HARṢA DĪKṢITA.
Aṅkagrantha. अङ्कग्रन्थ
An arithmetical work.
Manuscript reference:
GUJARAT. iv. p. 114, *2*, 16 ff. 1730 A.D.

HARṢA GAṆI.
Gaṇaka-kumuda-kaumudī. गणककुमुदकौमुदी 1662 A.D.
A commentary on the astronomical treatise *Karaṇakutūhala* of Bhāskarācārya. It is written under the patronage of a prince called Hemādrī in the Vindhya region.
Manuscript reference:
BM/CB. *451*, 43 ff. 1684 A.D.
CENSUS. *4734*, 28 ff. Nāgarī.
FSM/TA. p. 84, *261*, 15 ff. 1650 A.D.
GUJARAT. iv. p. 166, *297*, 39 ff.
VVRI/VB. *2640*, 78 ff. Nāgarī; *2675* 46 ff. Nāgarī.

Harṣakaumudī. see NṚSIṂHA DAIVAJÑA s.o. Rāma Daivajña.

Hayanagrantha. हयनग्रन्थ
An anonymous astronomical work.
Manuscript reference:
OUDH. vi. p. 10, *16*, 91 ff. Nāgarī.

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Hāyanaratna. see BALABHADRA.

Hayatagrantha. हयतग्रन्थ

An anonymous work on mathematics.

Manuscript reference:

CSC/HS & SG. ix. p. 174, *184*, 63 ff. Nāgarī. 1806 A.D.

HEDIRA DATTA.

Nakṣatranāmamālā. नक्षत्रनाममाला

An astronomical work.

Manuscript reference:

CP/HL. p. 222, *2398.*

HEMĀṄGADA ṬHĀKURA.

Grahaṇamālā. ग्रहणमाला c. 1753 A.D.

An astronomical work on eclipses of sun and moon.

Manuscript reference:

BORS/AB. iii, *51*, 20 ff. Maithili.

Jagaccandra-kiraṇāvalī. see DĀDĀBHĀI s.o. Mādhava Gaṁkara.

JAGADDAIVAJÑA.

Yantracintāmaṇi. यन्त्रचिन्तामणि

A tract primarily devoted to astronomical instruments.

Manuscript reference:

RORI/JM. ii, *5317*, 16 ff.

JAGANNĀTHA. (b. 1652 A.D.)

1. *Rekhāgaṇita* or *Rekhāgaṇita-kṣetra-vyāvahāra.* रेखागणित, रेखागणितक्षेत्रव्यावहार 1718 A.D.

A work on geometry, this is a translation into Sanskrit of Euclid's *Elements.* The translation was made from the Arabic version *Taḥrīr-u Uqlīdas* by Naṣīru'd-Dīn aṭ-Tūsī (1201 A.D.). As in the Arabic version, the book is divided into 15 chs. The Sanskrit version was prepared under the orders of Rājā Jai Singh Sawai of Jaipur. The number of geometrical propositions treated in the various chs. is as follows: (i) 48; (ii) 14; (iii) 37; (iv) 16, (v) 25; (vi) 33; (vii) 39; (viii) 25; (ix) 138; (x) 109; (xi) 41; (xii) 15; (xiii) 21; (xiv) 10; (xv) 6.

Manuscript reference:

AS/KBK. p. 165, two copies one in Bengali, the other in Nāgarī.
BANARAS. p. 265, *122*, ff. 1-292; p. 265, *118*, 218 ff.
BN/AC. i. *245(iii)*, Bengali. 1840 A.D.; *304(v)*, Bengali. 1840 A.D.

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BODLEIAN. *791*, 172 ff. Nāgarī.
CSC/HS & SG. ix, p. 115, *116*, 258 ff. Nāgarī; p. 117, *117*, 316 ff. Nāgarī. 1821 A.D. complete.
IO/JE. v, p. 1023, *2882*, 66 ff. Nāgarī.
NWP. viii. p. 56, *11*, 271 ff. Nāgarī.
RTL/MS. p. 171, 192 ff.

Printed text, translations etc.

The Rekhāgaṇita (v. 1, Book i-vi, v. 2, Books vii-xv) ed. with a critical preface, introduction and notes in English by Kamalaśaṅkara Prāṇaśaṅkara Trivedi. 2 vols. Bombay Sanskrit Series nos. 61-62, Bombay, 1901-2.

Study:

DATTA, B. 'Introduction to Arabic and Persian mathematics into Sanskrit literature', *PBMS*, **14**, 7-21, 1932.
WINTERNITZ, M. *Geschichte der indischen Litteratur*, **3**, 577, Leipzig, 1922.

2. *Samrāṭ-siddhānta.* सम्राट्सिद्धान्त

The work is a Sanskrit version of Ptolemy's *Almagest*, and was translated by Samrāṭ Jagannātha from the Arabic version as compiled by later Arabic astronomers such as Nasīru'd-Dīn aṭ-Tūsī, Ulug Beg and others. The author himself says:

ग्रन्थं सिद्धान्तसम्राजं सम्राट् रचयति स्फुटम् ।
तुष्टयै श्रीजयसिंहस्य जगन्नाथाह्वयः कृती ॥
अरबीभाषया ग्रन्थो मिजास्तीनामकः स्थितः ।
गणकानां सुबोधाय गीर्वाण्या प्रकटीकृतः ॥

It contains 13 chapters, 141 sections and 196 geometrical propositions of astronomical applications.

Manuscript reference:

BANARAS. p. 260, 125 ff. 1802 A.D. lacks 4th. ch.
BORS/AB. iii, *392*, 304 ff. Nāgarī. 1865 A.D.
CSC/HS & SG. ix, p. 119, *118*, 118 ff. Nāgarī. incomplete; p. 120, *119*, Nāgarī. incomplete, contains up to the end of the ninth prakaraṇa of the 13th. or the last ch.
CU/AMT. *1015*, ff. 1-96, 99-100. Nāgarī. incomplete.

3. *Siddhāntasārakaustubha.* सिद्धान्तसारकौस्तुभ

The work consists of three parts: Part I comprises *Samrāṭ Siddhānta;* Part II is devoted to Hindu astronomy.

Manuscript reference:

CSC/HS & SG. ix, p. 120, *119*, 288 ff. Nāgarī.
TCC/TA. p. 74, 1803 A.D. Nāgarī.

JAGANNĀTHA.

Parvasambhava. पर्वसम्भव

A small astronomical treatise.

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Manuscript reference:
NWP. x. p. 52, *33*, 4 ff. Nāgarī.

JAIMINI.

Jaimini-sūtra or Upadeśasūtra. जैमिनिसूत्र, उपदेशसूत्र
An astronomical work.

Manuscript reference:
AS/KBK. p. 68, Nāgarī.
BANARAS. p. 270, *177*, ff. 1-7; *108*, ff. 1-6. 1817 A.D.
GUJARAT. iv. p. 136, *125*, 12 ff. 1817 A.D.
OPPERT. *1240*.
TANJORE/PPS. xvi, *11392*, 9 ff. Grantha.

Commentators:
Bālakṛṣṇa, Kṛṣṇanātha Sarasvatī, Lakṣmaṇa, Nīlakaṇṭha, Veṅkaṭācārya, Veṅkateśa.

Printed text, translations etc.
Jaimini Sūtra with commentary *Subodhinī* by Nīlakaṇṭha Jyotishi, Benares (Litho).
Jaiminisūtra Jyotiṣamadhyāyadvayāntasahita-vyākhyā Jamalakṛtaṃ by Vināyaka Śāstrī Vetāla, Benares, 1911.
Jaiminisūtra (*Jaiminīya Paddhati*) i-ii, with Mārāṭhī translation & commentary by Viṣṇu Gopala Navāthe, Bombay, 1914.
Jaiminisūtra with *Udāharaṇa* and Sanskrit Hindi ṭīkā by Acyutānanda Jhā, published under Chowkhāmbā Sanskrit Series, 1952.

Jaiminisūtra. see JAIMINI
Jaimini-sūtrabhāṣya. see BĀLAKṚṢṆA s.o. Yādava.
Jaimini-sūtraṭīkā. see KṚṢṆĀNANDA SARASVATĪ.
Jaiminīya-sūtravyākhyā. see VEṄKAṬĀCĀRYA.

JARE.

Nakṣatranāma. नक्षत्रनाम
A short astronomical treatise containing different names of stars.

Manuscript reference:
NWP. x. p. 48, *10*, 4 ff. Nāgarī.

JAYA GOSVĀMIN.

Tithi-sāriṇī. तिथिसारिणी
Manuscript reference:
PU. ii, *3540*, 1 ff. Nāgarī; *3541*, 22 ff. Nāgarī.

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JAYALAKṢMAṆA.

Śiromaṇiṭīkā. शिरोमणिटीका

A commentary on the *Siddhāntaśiromaṇi* of Bhāskarācārya.

Manuscript reference:

NWP. i, p. 518, *36*, 211 ff. Nāgarī.

JAYARĀMA.

1. *Khecara-kaumudī.* खेचरकौमुदी

Manuscript reference:

CP/HL. p. 108, *1130*.
GUJARAT. iv. p. 120, *38*, 57 ff.

2. *Graha-gocara.* ग्रहगोचर

Manuscript reference:

CP/HL. p. 243, *1530*.

JAYASIṂHA.

1. *Dṛkpakṣasāraṇī.* दृक्पक्षसारणी

A table for finding out lunar days according to the motion of the planets, determined by means of astronomical observations. The table was prepared by order of Jayasiṃha, king of Jayapur. A short account of the work is given in the introduction.

Manuscript reference:

CSC/HS & SG. ix. *55*, 26 ff. Nāgarī.

2. *Yantrarāja.* यन्त्रराज

An astronomical work giving directions for the preparation of a universal sundial.

Manuscript reference:

BIK/RM. p. 351, *759*, 25 ff. Nāgarī.
CENSUS. p. 233, *4715*, 35 ff.
NWP. i. p. 508, *10*, 25 ff. Nāgarī.

Study:

HUNTER, W. 'Some account of the astronomical labour of Jayasimha etc.', *AR*, **5**, 209, 1799.

KAYE, G. R. *A guide to the Observatories at Delhi, Jaipur Ujjain, Banaras*, Calcutta, 1920.

JINABHADRA GAṆI.

Kṣetrasamāsa. क्षेत्रसमास

A geometrical work important from the point of view of the Jaina contribution to mathematics.

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Manuscript reference:
GOS/21. p. 28, *235*, 211 ff.; p. 36, *285(2)*, 199 ff.
GOS/76. *44*, 246 ff. 1217 A.D.

Commentators:
Malayagiri Sūri and Siddha Sūri.

Study:
DATTA, B. 'The Jaina School of Mathematics', *BCMS*, **21**, 115-45, 1929.

JIVANĀTHA JHĀ b. o. Nīlāmbara Jhā.

1. *Makarandodāharaṇa.* मकरन्दोदाहरण

A commentary on the astronomical work *Tithipatra* of Makaranda.

Manuscript reference:
BORS/AB. iii, *251 A. B.*, 9 ff. Maithili.

2. *Uḍūdaya-pradīpa.* उडूदयप्रदीप

An astronomical work with author's own commentary *Tattva-dīpikā.*

Manuscript reference:
BORS/AB. iii, *125*, 12 ff. Maithili.

Jñānabhāskara. ज्ञानभास्कर

Manuscript reference:
GUJARAT. iv, p. 136, *132*, 146 ff. 1550 A.D.

Jñānamañjarī. see SOMANĀTHA.

JÑĀNARĀJA s.o. Nāganātha. (c. 1503 A.D.)

1. *Siddhāntasundara.* सिद्धान्तसुन्दर

A work dealing with astronomy and astronomical geography. It has 18 chapters, *viz.*, (i) Madhyamādhikāra (ii) Spaṣṭī-karaṇādhyāya (iii) Tripraśnādhyāya, (iv) Parvasambhūti-nāmādhyāya, (v) Candragrahaṇāmādhyāya, (vi) Sūrya-grahaṇādhikāra, (vii) Grahodayāstādhikāra, (viii) Nakṣa-tracchāyā-ghaṭīsādhanādhikāra, (ix) Śṛṅgonnatyadhikāra, (x) Grahayogādhyāya, (xi) Tārāchāyābhadhruvādhyāya, (xii) Pātādhyāya, (xiii) Golādhyāye Bhuvanakośādhikāra, (xiv) Golādhyāye Madhyabhukti-vāsanādhyāya (xv) Golā dhyāye Chedyake yukti (xvi) Golādhyāye Maṇḍalavarṇana, (xvii) Yantramālā, (xviii) Golādhyāye ṛtuvarṇana. In several manuscripts the above chapters are classed mainly under two headings *viz*, (i) Pātādhyāya (ii) Golādhyāya.

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Manuscript reference:
ANUP. v. p. 402, *34*, 6 ff.; p. 402, *35*, 24 ff.
AS/HS & PS. x. *6934*, 13 ff. Nāgarī, 1832 A.D.; *6936*, 27 ff. Nāgarī, 1821 A.D.
BANARAS. p. 260, *60*, ff. 1-4, 6-7, 11-14, 16-21; *63*, 24 ff. 1660 A.D.
BERLIN. p. 232, *833*, 21 ff. 1600 A.D.
BM/CB. *452*, 27 ff.
BORS/AB. iii, *417*, 10 ff. Maithili.
CP/HL. p. 244, *178*, 51 ff.
GUJARAT. iv. p. 208, *528*, 49 ff.
IO/JE. v, *2901*, 55 ff. Nāgarī. 1652 A.D.; *2902*, 37 ff. Nāgarī, 1782 A.D.
LU. *108*.
NOTICES/RM. v. *1767*, 14 ff. Maithili.
RAS/BB/HV. *289*, 15 ff. Nāgarī.
RORI/JM. ii, *4733*, 31 ff. 1786 A.D.

Commentator:
Cintāmaṇi.

Study:
CHAKRABARTY, GURUGOVINDA. 'Surd in Hindu Mathematics', *JDL/CU*, **24**, 29-58, 1934.

2. *Sundarasiddhāntabīja.* सुन्दरसिद्धान्तबीज

Manuscript reference:
BANARAS. p. 257, *2*, 27 ff.

Joisa-dāra. जोइसदार
A Jaina work on astronomy.

Manuscript reference:
GOS/76. *116*.

Joisakaraṇḍaka. see PŪRVADHARA.

Jyāsādhanaprakāra. ज्यासाधनप्रकार
An anonymous table of sines.

Manuscript reference:
AS/HS & PS. x. *6867*, 2 ff. Nāgarī.

Jyautiṣagrantha. see KṚṢṆA BHAṬṬĀRYA. s.o. Narasiṃha.

Jyautiṣamakaranda. see NANDANA s.o. Amara Siṃha.

Jyautiṣamālā. ज्यौतिषमाला
An anonymous astronomical work.

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Manuscript reference:
RORI/JM. ii. p. 95-99, 2 ff. 18th. century.

Jyautiṣanibandha. ज्यौतिषनिबन्ध
An anonymous astronomical work.

Manuscript reference:
RORI/JM. ii. p. 90-93, ff, 45-75, 18th. century. incomplete.

Jyautiṣasiddhāntasaṃgraha. ज्यौतिषसिद्धान्तसंग्रह
A collection of astronomical works comprising *Somasiddhānta, Brahmasiddhānta, Pitāmahasiddhānta* and *Vṛddhavaśiṣṭhasiddhānta.*

Printed text, translations etc.
Jyautiṣasiddhāntasaṃgraha ed. by Pandits of Banaras under the superintendence of G. Thibaut (Banaras Sanskrit Series no. 152 & 154). Two fasciculus.
Fasciculus I. contains *Somasiddhānta* and *Brahmasiddhānta.* ed. by Pandit Vindhyeśvarī Prasad Dvivedi, Benares, 1912.
Fasciculus II. contains *Pitāmahasiddhānta* & *Vṛddhavaśiṣṭhasiddhānta* ed. by Vindhyeśvarī Prasad Dvivedi, Benares, 1917.

Jyautiṣaviṣaya. ज्यौतिषविषय 1687-1747. A.D.
An anonymous astronomical work in 3 chs. *viz.*, (i) Dhruvānayana, (ii) Ayanānayana, (iii) Tithyānayana, (iv) Grahaṇānayana.

Manuscript reference:
MADRAS/T. vol. iii. part i. Sanskrit B. *2602* ff. 16a-17b, Telugu.
PU. ii. *3481*, 1 ff. Nāgarī.

Jyotiḥ-pradīpikā. see LAKṢMAṆA.

Jyotiḥ-sāgara. ज्योतिःसागर
An anonymous astronomical work.

Manuscript reference:
GUJARAT. iv. p. 138, *138*, 12 ff.
NU/VK. *762*, ff. 2-51, Nāgarī.

Jyotiḥ-sāgarasāra. see MATHUREŚA

Jyotiḥ-sāra. see RĀGHAVENDRA ŚARMAN.

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Jyotiḥ-sāra-samuccaya. ज्योतिःसारसमुच्चय
An anonymous astronomical work.
Manuscript reference:
GUJARAT. iv, p. 140.

Jyotirgaṇita. see VEṄKATEŚA KEṬAKARA.
Jyotirvidaśṛṅgāra. see ACALĀCĀRYA

Jyotiṣa. ज्योतिष
An anonymous astronomical work.
Manuscript reference:
AS/KBN. *7514; 7842; 7923; 7926; 7938.*
KANNADA. *898*, 63 ff. Kanarese.
M & C/LR. *286*, Kanarese; *287*, Nāgarī.

Jyotiṣa. see NĀRACANDRA.
Jyotiṣābharaṇa. see TRIVIKRAMA.
Jyotiṣa-bhāṣya. see SOMĀKARA.

Jyotiṣābhidhāna. ज्योतिषाभिधान
An anonymous astronomical work.
Manuscript reference:
BN/AC. i, *972(i)*, Bengali, 1840 A.D.

Jyotiṣa-candrikā. see OṂKĀRA BHAṬṬA.
Jyotiṣa-candrikā. see RUDRADEVA s.o. Mahādeva.
Jyotiṣa-candrodaya. see DHANURJAYĀCĀRYA.
Jyotiṣa-darpaṇa. see YALLAYA s.o. Śrīdharācārya.

Jyotiṣa-graha-vicāra. ज्योतिषग्रहविचार
An anonymous astronomical work.
Manuscript reference:
BN/AC. i. *968(ix)*, Nāgarī. 18th. century.

Jyotiṣa-grantha. ज्योतिषग्रन्थ
An anonymous astronomical work.
Manuscript reference:
BN/AC. i, *968(vi)*, Nāgarī, 18th. century; *968(vii)*, Nāgarī, 18th. century.
M & C/LR. *290*, Kanarese.
MADRAS/D. xxiv, *13422*, 16 ff. Grantha & Tamil.

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Jyotiṣa-kalpataru. see KAVI GŪḌĀMAṆI

Jyotiṣa-kalpataru. see CAKRACŪḌĀMAṆI.

Jyotiṣa-karaṇḍaka. see PŪRVADHARA.

Jyotiṣa-karaṇḍaṭīkā. see MALAYAGIRI SŪRI.

Jyotiṣa-kedāra. see KṚPĀŚAṂKARA.

Jyotiṣa-kroḍapatra. ज्योतिषक्रोडपत्र
An anonymous astronomical work.
Manuscript reference:
PU. ii, *3463*, 6 ff. Nāgarī.

Jyotiṣa-nighaṇṭu ज्योतिषनिघण्टु
An anonymous astronomical work.
Manuscript reference:
CP/FK. p. 228, *40*, 2 ff.
OPPERT. i, *4745*, 21 ff. Grantha.

Jyotiṣa-prabodhinī. see GAṆEŚA DAIVAJÑA

Jyotiṣa-pradīpa. see RĀMA ŚARMAN.

Jyotiṣa-prakaraṇa. ज्योतिषप्रकरण
An anonymous astronomical work.
Manuscript reference:
M & C./LR. *291*, Telugu.

Jyotiṣa-prakāśa. ज्योतिषप्रकाश
An anonymous astronomical tract.
Manuscript reference:
CP/FK. p. 228, *41*, 133 ff.

Jyotiṣaratna. see GOVINDA PAṆḌITA.

Jyotiṣa-ratnasaṃgraha. see GOVINDA.

Jyotiṣasaṃgraha. ज्योतिषसंग्रह
An anonymous astronomical work.
Manuscript reference:
AS/KBN. *6636.*
CP/FK. p. 228, *44*, 9 ff.

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Jyotiṣa-saṃgraha-ratnamālā. ज्योतिषसंग्रहरत्नमाला
An anonymous astronomical work.
Manuscript reference:
BN/AC. i, *974(i)*, Kashmiri. 18th. century.

Jyotiṣaṣaṃhitārṇava. see SŪNṚTAVĀDIN.

Jyotiṣa-saṃjñā. ज्योतिषसंज्ञा
An anonymous work.
Manuscript reference:
AS/KBN. *7068.*

Jyotiṣasāra. ज्योतिषसार
An anonymous astronomical treatise.
Manuscript reference:
AS/KBN. *7466.*
BIK/RM. p. 306, *659*, 34 ff. Nāgarī.
CP/FK. p. 228, *43*, 10 ff. 1775 A.D.
RORI/JM. ii, *4891*, 20 ff. 18th. century; *5813*, 98 ff. 19th century.

Jyotiṣasāraṇī or *Rāmavinodasāraṇī.* ज्योतिषसारणी, रामविनोदसारणी
c. 1755 A.D.
An anonymous astronomical table on movements of the planets in arithmetical figures used for the preparation of almanacs, based on the *Rāmavinoda* of Rāma Daivajña.
Manuscript reference:
CSC/HS & SG. ix, *36*, 300 ff. Nāgarī.

Jyotiṣa-sāra-saṃgraha. ज्योतिषसारसंग्रह
An anonymous astronomical work.
Manuscript reference:
AS/KBN. *6915.*
RAS/BB/VM. p. xlvii, 8 ff.
RORI/JM. ii, *4407*, 25 ff. 1789 A.D.; *4410*, 26 ff. 18th. century; *6537*, 33 ff. 1817 A.D.

Jyotiṣa-siddhānta. ज्योतिषसिद्धान्त
An anonymous astronomical work.
Manuscript reference:
M & C/LR. *292*, Nāgarī.

Jyotiṣa-siddhāntasāra. see MATHURĀNĀTHA ŚUKLA.

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Jyotiṣa-vedāṅga. see LAGADHA.

Jyotiṣavṛtta. see MAHEŚVARĀCĀRYA.

Jyotiścandrārka. see MAHĀDEVA s.o. Hirāmaṇi.

Jyotiṣīnāmamālā. see HARIDATTA s.o. Śrīpati.

Jyotiṣopadeśi-sūtra-vyākhyāna. ज्यौतिषोपदेशिसूत्रव्याख्यान
An anonymous astronomical work.
Manuscript reference:
M & C/LR. *288*, Nāgarī.

Jyotissāra-samuccaya. see CŪḌĀMAṆI.

Jyotiśśāstrabhāsya. see SOMĀKARA.

Jyotissiddhāntasāra. see RAGHUNĀTHA

COMPLIMENTARY

Jyotpatti. ज्योत्पत्ति
An anonymous astronomical work.
Manuscript reference:
OUDH. (1890). p. 128, *114*, 4 ff. Nāgarī.

Jyotpatti-vyākhyā. see NĪLĀMBARA JHĀ.

Jyotpattisāra. see VIDYĀNĀTHA s.o. Śrīnātha Sūri.

Jyotpatti-śiromaṇi. ज्योत्पत्तिशिरोमणि
An anonymous work on geometry.
Manuscript reference:
BIK/RM. *662*, 19 ff. Nāgarī.

Kairāśyudāharaṇa. see KAMALĀKARA s.o. Nṛsiṃha.

Kālacakravivaraṇa. see NĀRĀYAṆA ŚARMAN.

Kālacakravivaraṇaṭīkā. see NĀRĀYAṆA ŚARMAN.

Kālajñāna. कालज्ञान
An anonymous astronomical work.
Manuscript reference:
AS/KBK. p. 40.

Kālakalana. कालकलन
An anonymous astronomical work.
Manuscript reference:
JRAS/1912. *286*, 2 ff. Śāradā.

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Kālanirṇaya. see MĀDHAVĀCĀRYA.

Kālaprakāśikā. see NARASIṂHA.

KALPAKURTI ALLANĀRYA SŪRI.

A Telugu commentary on the *Sūrya-siddhānta.*

Manuscript reference:

MADRAS/T. vol. iv. part i. Sanskrit A, *3090*, 222 ff. Telugu. 1919-20 A.D.

Kalpalatā. कल्पलता

An anonymous astronomical table for the computation of calendars.

Manuscript reference:

IO/JE. v. *2941*, 28 ff. Nāgarī. 1650 A.D.

Kalpalatā. see KṚṢṆA DAIVAJÑA.

Kalpalatā. see SOMA DAIVAJÑA s.o. Rudrabhaṭṭa.

Kalpalatāvatāra. see KṚṢṆA DAIVAJÑA s.o. Ballāla.

Kalpataru. see GOPARĀJA PAṆḌITA.

Kalpavallī. see YALLAYA s.o. Śrīdharācārya.

KALYĀṆA.

Tithi-kalpadruma. तिथिकल्पद्रुम

A summary of rules for calendar making and tables for calculating time.

Manuscript reference:

GUJARAT. iv. p. *146*, *18*, 4 ff.
IO/JE. v., *2962*, 24 ff. Nāgarī. 1725 A.D.
RAS/BB/HV. *236*, 2 ff. Nāgarī. 1686 A.D.

KĀMA.

1. *Līlāvatīvyākhyā.* लीलावतीव्याख्या

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

MADRAS/T. vol. iii. part i. Sanskrit C, *3864C*, ff. 79-25b, Telugu.

2. *Sūryasiddhāntavyākhyā.* सूर्यसिद्धान्तव्याख्या

A commentary on the *Sūryasiddhānta.*

Manuscript reference:

IO/AK. ii. part ii. *6287*, 106 ff. Nāgarī. 1800 A.D.

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Kāmadogdhrī. see TAMMAYA.

Kāmadughāsāriṇī. कामदुघासारिणी
An anonymous table for calculating planetary motions.
Manuscript reference:
BIK/RM. *666*, 6 ff. Nāgarī.

KAMALĀKARA. s.o. Nṛsiṃha. (c. 1616 A.D.)

1. *Grahagolatattva.* ग्रहगोलतत्त्व
An astronomical work.
Manuscript reference:
CSC/HS & SG. ix. p. 156, *165(ii)*, 84 ff. Nāgarī. 1658 A.D.

2. *Grahasāraṇī.* ग्रहसारणी c. 1579 A.D.
An astronomical work.
Manuscript reference:
ANUP. iv. p. 349, *46.*

3. *Kairāśyudāharaṇa.* कैराश्युदाहरण
Probably a portion of the commentary on Bhāskarācārya's *Līlāvatī.*
Manuscript reference:
PU. ii. *3310*, 6 ff, Nāgarī.

4. *Manoramā.* मनोरमा
A commentary on the astronomical work *Grahalāghava* of Gaṇeśa Daivajña.
Manuscript reference:
CP/FK. p. 230, *107*, 40 ff. 1662 A.D.

5. *Saura-vāsanā.* सौरवासना
A commentary on the *Sūryasiddhānta.*
Manuscript reference:
BANARAS. p. 218, *83*, ff. 1-44.
RAS/BB/HV. *297*, 41 ff. Nāgarī.
RORI/JM. ii, *4757*, 49 ff. 1743 A.D.

6. *Śeṣavāsanā.* शेषवासना
It is a supplement to author's *Siddhānta-tattvaviveka.*
Manuscript reference:
AS/HS & PS. x. *6947*, 31 ff. Nāgarī. 1795 A.D.
BORI/AB. iii, *373, A. B.* 16 ff. Miathili. 1872 A.D.

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7. *Siddhānta-tattvaviveka* or *Siddhāntatattva*

सिद्धान्ततत्त्वविवेक, सिद्धान्ततत्त्व 1658 A.D.

An astronomical work based on the *Sūryasiddhānta*. It has 14 chapters. The topics dealt with are: time, measurement of time of day and night; effect of longitude on the duration of day; duration of yugas; various Eras; opinion of the author on the *Siddhānta Śiromaṇi*; excellence of *Sūryasiddhānta*; motion of the stars in space; refutation of the opinion of Āryabhaṭṭa regarding the motion of the earth; equatorial region; longitude of different places; diameter and circumference of the earth; solstitial movement; dṛkkāṇas; coldness of air in high places; causes of rainbows; causes of earthquakes; orbits of planets; zenith & nadir; instrument for ascertaining saṅkrāntis; centripetal forces; cause of circular motion; apparent motion of celestial sphere; chords of arcs; diagrams.

Manuscript reference:

ĀS/KBK, p. 223, Bengali.
BANARAS. p. 26, *160.*
BORI/AB. iii. *127*, 40 ff. Maithili.
CSC/HS & SG. ix. *165(i)*, 102 ff. Nāgarī.
IO/JE. v. *2890*, 294 ff. Nāgarī. 1792 A.D.; *2892*, 39 ff. Nāgarī.
NOTICES/RM. v. *1865*, 135 ff. Maithili.
NWP. vi. p. 62, *1*, 150 ff. Nāgarī; vi. p. 62, *2*, 170 ff. Nāgarī.
RAS/BB/HV. *265*, 171 ff. Nāgarī. 1783 A.D.
RAS/BB/VM. p. lv. *171.*
RTL/MS. p. 175, 98 ff. Kashmiri.
TCC/TA. p. 56, 50 ff. Nāgarī. early 17th. century.

Commentators:

Nīlāmbara Jhā, Raghunātha and Veṅkaṭeśa.

Printed text, translations etc.

Siddhāntatattvaviveka, with notes by Sudhākara Dvivedi. Ed. with notes by Muralidhara Jhā. Benares Sanskrit Series, Benares. 1885.

Siddhāntatattvaviveka. Published by Kṛṣṇadeva Gupta & Co.

Siddhāntatattvaviveka. A treatise on astronomy. Ed. with a commentary by Gaṅgādhara Miśra Śarmā, Lucknow, 1929.

Study:

DATTA, B. 'Introduction of Arabic and Persian Mathematics into Sanskrit letrature', *PBMS*, **14**, 7-21, 1932.

SINGH, A. N. 'Hindu Trigonometry', *PBMS*, n.s. **1**, 77-92, 1939.

WINTERNITZ, M. *Geschichte der indischen Litteratur*, **3**, 565, Leipzig, 1922.

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KAMALANAYANA. (c. 1747 A.D.)

Bhāsvatyudāharaṇa. भास्वत्युदाहरण c. 1747 A.D.
A commentary on the *Bhāsvatī* of Śatānanda.

Manuscript reference:
BORS/AB. iii, *238*, 7 ff. Maithili. 1793 A.D.

KAPARDĪSVĀMĪ.

Āpastamba-śulbasūtrabhāṣya. आपस्तम्बशुल्वसूत्रभाष्य
It is a commentary on the *Śulba-sūtra* of Āpastamba.

Manuscript reference:
AS/KBK. p. 25, Nāgarī.
BANARAS/TU & SJ. *4303*, 40 ff. Nāgarī.
BU/HV. p. 23, *121*, 66 ff. Nāgarī. 1747 A.D.
PU. i. p. 39, *93*, 61 ff.
TANJORE/AB. p. 15, *100*, 50 ff. Nāgarī.

Karaṇabhūṣaṇa. करणभूषण
An anonymous astronomical work.

Manuscript reference:
NWP. v. p. 94, *39*, 41 ff. Nāgarī.

Karaṇabhūṣaṇa. see CUNNĪRĀMA.

Karaṇakaustubha. see KṚṢṆA DAIVAJÑA s.o. Mahādeva.

Karaṇakeśarī. करणकेशरी
An anonymous work.

Manuscript reference:
CP/HL. p. 64, *677*.
GUJARAT. iv. p. 116, *17*, 13 ff.

Karaṇakeśarī. see RĀMA ĀCĀRYA.

Karaṇakutūhala. see BHĀSKARĀCĀRYA.

Karaṇakutūhalabhāṣya. करणकुतूहलभाष्य
An anonymous commentary on the *Karaṇakutūhala* of Bhāskarācārya.

Manuscript reference:
AS/HS & PS. x, *6839*, 38 ff. Nāgarī. 1649 A.D.
IO/JE. v. *2927*, 72 ff. Nāgarī. 1510 A.D.

Karaṇakutūhala-sāriṇī. see MAHEŚVARA.

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Karaṇakutūhala-ṭīkā. see CAṆḌĪDĀSA s.o. Rāghava.

Karaṇakutūhalaṭīkā. see EKANĀTHA s.o. Śārṅgaḍ.

Karaṇakutūhala-ṭippaṇī. करणकुतूहलटिप्पणी

An anonymous commentary on the *Karaṇakutūhala* of Bhāskarācārya.

Manuscript reference:

ANUP. iv. p. 343, *62*, 19 ff.

Karaṇakutūhalavṛtti. करणकुतूहलवृत्ति

An anonymous commentary on the *Karaṇakutūhala* of Bhāskarācārya.

Manuscript reference:

ANUP. iv. p. 343, *63*, 51 ff.
AS/HS & PS. x. *6841*, ff. 17-27.

Karaṇakutūhala-vyākhyā. करणकुतूहलव्याख्या

An anonymous commentary on the *Karaṇakutūhala* of Bhāskarācārya with illustrations.

Manuscript reference:

IO/JE. v. *2929*, 35 ff. Nāgarī. 1673 A.D.

Karaṇakutūhalodāharaṇa. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

Karaṇapaddhati. करणपद्धति 15th century A.D.

An astronomical treatise in 10 chs. Ch. 6 is of special importance as it gives rules for trigonometrical sine, cosine, tan and π series. The name of the author is not available. The last verse of the tenth chapter reads *'iti śivapurānāmagrāmajaḥ kopi yajvā'* etc.

Manuscript reference:

MADRAS/D. xxiv. *13397*, 10 ff. Telugu.
MADRAS/T. vol. ii, part i. Sanskrit A, *1310*, 63 ff. Nāgarī & Malayalam; vol. vi. part i. Sanskrit, *5194*, 36 ff. Malayalam, 1925-26 A.D.; *5234*, 65 ff. Malayalam.
VVRI/VB. p. 76, *3841*. Malayalam.

Printed text, translations etc.

The Karaṇapaddhati. Ed. by K. Sambaśiva Śāstrin. Trivendrum Sanskrit Series. No. 126. Trivendrum, 1937.

Study:

BALAGANGADHARAN, K. 'Appendix: on the Hindu Quadrature of the Circle', *JBBRAS*, no. **20,** 77-82, 1944.

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MARAR, K. and RAJAGOPAL, C. T. 'On the Hindu Quadrature of the Circle', *JBBRAS*, **20,** 56-77, 1944.

RAJAGOPAL, C. T. 'A neglected chapter of Hindu Mathematics', *SM*, **15,** nos. 3-4, 201-209, 1949.

RAJAGOPAL, C. T. and AIYAR, T. V. Vedamurtti, 'On the Hindu Proof of Gregory's Series', *SM*, **17,** nos. 1-2, 65-74, 1951.

RAJAGOPAL, C. T. and VENKĀTARAMAṆ, A. 'The Sine and Cosine Power Series in Hindu Mathematics (with an addendum by K. M. George)', *JASB*, 3rd. Series, **15,** 1-13, 1949.

WHISH, C. M. 'On the Hindu Quadrature of the circle and the infinite series of the proportion of the circumference to the diameter exhibited in the four Śāstras—The *Tantrasaṃgraha*, *Yuktibhāṣā*, *Karaṇapaddhati* and *Sadratnamālā*'. *TASGBI*, **3,** 509-23, 1835.

Karaṇapaddhati-vyākhyā. करणपद्धतिव्याख्या

An anonymous commentary on the *Karaṇapaddhati.*

Manuscript reference:

RAS/MW. *146*(*5*), 50 ff. Malayalam. 1817 A.D.

Karaṇa-pañcāṅga. see BABUĀ SŪRI.

Karaṇapradīpikā-śiśubodhinī. see KEŚAVA.

Karaṇaprakāśa. see BRAHMADEVA GAṆAKA s.o. Śrīcandra.

Karaṇaprakāśaṭīkā. see SUDHĀKARA DVIVEDIN.

Karaṇaprakāśa-vivṛti. see GOVINDA s.o. Viśvanātha.

Karaṇaprakāśavṛtti. see DĀMODARA, pupil of Padmanābha.

Karaṇaprakāśavyākhyā. see ŚRĪNIVĀSA.

Karaṇa-sāriṇī (*Brahmatulya*). करणसारिणी (ब्रह्मतुल्य)

An anonymous work.

Manuscript reference:

RORI/JM. ii. p. 86, *31*, 19 ff. 18th century.

Karaṇatantra. see PRASANNAKARAṆA.

Karaṇavaiṣṇava. see ŚAṄKARA s.o. Śukadeva Bhaṭṭa.

Karaṇottama. see ACYUTA.

Karapañcāṅga. see RĀMAKṚṢṆA.

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KARAVINDASVĀMĪ.

Āpastamba-savyākhyā. आपस्तम्बसव्याख्या

It is a commentary on the *Śulbasūtra* of Āpastamba.

Manuscript reference:

AS/HS. p. 482. *535 & 536*, 74 ff. Nāgarī. complete; p. 483, *537*, 15 ff. Nāgarī. complete; p. 493, *557*, 61 ff. Nāgarī. complete. 1697 A.D.
AS/KBK. p. 25. Nāgarī.
BANARAS/TU & SJ. p. 374, *4094*, 67 ff. Nāgarī; p. 386, *4239*, 68-84 ff. Nāgarī.
PU. p. 39, *95*, 74 ff.
TANJORE/AB. p. 15, *101*, 84 ff. Nāgarī.
VVRI/VB. p. 74, *13*, 56 ff. Nāgarī. Two copies; another copy of 38 ff. Nāgarī.

KARKA.

Kātyāyana-śulbasūtravivaraṇa. कात्यायनशुल्वसूत्रविवरण

It is a commentary on the *Śulbasūtra* of Kātyāyana.

Manuscript reference:

BANARAS/TU & SJ. p. 372, *4080*, ff. 5-16. Nāgarī.
BU/HV. p. 24, *123*, 8 ff. Nāgarī. 1873 A.D.
IO/JE. *364*.
PU. i. p. 134, *52*, 12 ff, 1655 A.D.
VVRI/VB. p. 74, *13*, 12 ff. Nāgarī.

Karmadīpaka. see NĀRĀYAṆA.

Karmadīpikā. see PARAMEŚVARA.

Karmadīpikā. see RĀMA.

Karmapradīpikā. see NĀRĀYAṆA.

Karmapradīpikā. see MĀDHAVA.

Karmapradīpikā. see RĀMA.

Karmaprakāśinī-vṛtti. see SMARASIṂHA.

Karmaratnāvalī. see BILHANA.

Karmavipāka. see DEVACANDRA.

Karṇāṭa-ṭīkā. see AMAREḌYA S.O. Gosvāmī.

KARPŪRARATNA.

Candrārkasāriṇīkoṣṭhaka. चन्द्रार्कसारिणीकोष्ठक

Manuscript reference:

RAS/BB/VM. p. xlvi. 6 ff.

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KĀŚĪ DĪKṢITA.

Ṣaṭpañcāśikā. षट्पञ्चाशिका

An astronomical work.

Manuscript reference:

CP/HL. p. 538, *6024.*
GUJARAT. iv. p. 200, *483*, 5 ff. 1853 A.D.

KĀŚĪRĀJA.

Grahaṇaparvadvayadīpa. ग्रहणपर्वद्वयदीप

An astronomical treatise dealing with solar and lunar eclipses.

Manuscript reference:

AS/HS & PS. x. *6855*, 2 ff. Nāgarī. 18th century.

KĀŚĪ-RĀJA.

Kheṭaplava. खेटप्लव

An astronomical work dealing with movements of the ascending node of the planet which causes eclipses.

Manuscript reference:

BIK/RM. 674, 20 ff. Nāgarī.

KĀŚĪŚVARA.

Tithyadhikāra. तिथ्यधिकार

An anonymous work.

Manuscript reference:

CP/FK. p. 230, 57, 66 ff.

KĀTYĀYANA.

Kātyāyana-śulbasūtra or *Kātyāyana-śulba-pariśiṣṭa* or *Kātīya Śulba-pariśiṣṭa.* कात्यायनशुल्बसूत्र, कात्यायनशुल्वपरिशिष्ट, कातीयशुल्वपरिशिष्ट

The work contains altogether 102 sūtras in six kaṇḍikās (or small sections). It discusses the geometrical proportions, the different measures, relative positions and spatial relations of the various vedis in connection with their construction. It gives also a description of the measuring tape, the gnomon, and the attributes of an expert altar-builder.

Manuscript reference:

BANARAS/TU & SJ. p. 368, *4039*, ff. 3-4, 8-9, Nāgarī; p. 380, *4148*, 17 ff. Nāgarī; p. 394, *4320*, 6 ff. Nāgarī; p. 402, *4414*, 10 ff. Nāgarī; p. 402, *4425*, 9 ff. Nāgarī.

Commentators:

Gaṅgādhara, Karka, Mahīdhara, Rāmacandra.

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Printed text, translations, etc.

Kātyāyana Śulba. A portion of this work, only the first two chapters, was published by G. Thibaut with English translation. *PANDIT*, no. **4**, 1882.

Kātyāyana Śrautasūtra. with comm. by Śri Karkācārya. Ed. Paṇḍit Madana Mohana Pāṭhaka, Benares, 2 vols. 1900. (This contains the *Kātyāyana Śulbasūtra.*)

Kātyāyanaśulba. Ed. with Karka's *Bhāṣya* and Mahīdhara's *Vṛtti* in the Kāśī Sanskrit Series, Benares, 1936.

Study:

CANTOR, M. *Vorlesungen uber dei Geschichte der Mathematik*, **1**, 3, 636-645, 1907.

DATTA, B. *The Science of Śulba—A Study in early Hindu Geometry*, Calcutta University, 1932.

LEVI, B. 'Osservazioni e congetture sopra la geometria degli indiani', *BM*, **9**, 97-105, 1908-9.

MAZUMDAR, N. K. 'On the different Śulba Sūtras', *PTOC/LI, 561-64*, Calcutta, 1922.

SMITH, D. E. *History of Mathematics*, **1**, 97-98, Dover Edition, 1958.

WINTERNITZ, M. *Geschichte der indischen Litteratur*, **3**, 176, Leipzig, 1922.

Kātīya Śulbapariśiṣṭa. see KĀTYĀYANA

Kātyāyanaśulbabhāṣya. see GAṄGĀDHARA.

Kātyāyanaśulbapariśiṣṭa. see KĀTYĀYANA.

Kātyāyana-śulbasūtra. see KĀTYĀYANA.

Kātyāyana-śulbasūtravivaraṇa. see KARKA.

Kātyāyana-śulbasūtra-vivṛti. see MAHĪDHARA.

Kātyāyana-śulbavyākhyā. see RĀMACANDRA.

Kautukacintāmaṇi. see RĀMA s.o. Gaṇeśa.

Kautukalīlāvatī. sec PARAMA.

Kautukalīlāvatī. see RĀMA.

KAVI CŪḌĀMAṆI.

Jyotiṣa-kalpataru. ज्योतिषकल्पतरु

An astronomical work.

Manuscript reference:

NOTICES. iv. *1754*, 45 ff. Nāgarī. 1839 A.D.

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Kendrabha. केन्द्रभ
An anonymous astronomical work.
Manuscript reference:
BM/CB. *474B*, 25 ff. 18th. century.

KEŚAVA.
Bhāsvatyudāharaṇa. भास्वत्युदाहरण
A commentary on the *Bhāsvatī* of Śatānanda.
Manuscript reference:
OUDH (1890). p. 120, *74*, 18 ff. Nāgarī.

KEŚAVA.
Grahalāghava. ग्रहलाघव
Manuscript reference:
GUJARAT. iv. p. 126, *73*, 15 ff.

KEŚAVA.
Karaṇapradīpikā-śiśubodhinī. करणप्रदीपिका-शिशुबोधिनी
Manuscript reference:
PU. ii. *3284*, 47 ff. Nāgarī. 1711 A.D.; *3285*, 26 ff. Nāgarī.

KEŚAVA.
Līlāvatīvyākhyā. लीलावतीव्याख्या
A commentary on the *Līlāvatī* of Bhāskarācārya.
Manuscript reference:
TANJORE/PPS. xvi, *11592*, 63 ff. Nāgarī.

KEŚAVA DAIVAJÑA of Nandigrāma, s.o. Kamalākara and father of Gaṇeśa Daivajña (c. 1496 A.D.)
Grahakautuka. ग्रहकौतुक 1496 A.D.
Manuscript reference:
CP/FK. p. 226, *21*, 18 ff. 1816 A.D.
CP/HL. p. 143, *1529*.
According to his son Gaṇeśa Daivajña, he seems to have written also commentaries on the *Grahakautuka*, called *Mitākṣarā*, *Grahacalana*, and *Gaṇitadīpikā*, apart from many works on astrology and horoscopy.

KEŚAVA DAIVAJÑA.
Grahalāghavavyākhyāna. ग्रहलाघवव्याख्यान
A commentary on the *Grahalāghava* of Gaṇeśa Daivajña.
Manuscript reference:
M & C/LR. *281*, Nāgarī.

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KEŚAVA DAIVAJÑA. (15th. century).

Siddhāntalaghukṣamaṇikā. सिद्धान्तलघुक्षमणिका

A treatise on astronomy based on the *Sūryasiddhānta*, in 9 chs. *viz.*, (i) Kālādhyāya, (ii) Bhagaṇādhikārādhyāya, (iii) Madhyamādhikāra, (iv) Grahamadhyādhikāra, (v) Kakṣādhyāya, (vi) Spaṣṭādhikāra, (vii) Candragrahaṇādhikāra, (viii) Sūryagrahaṇādhikāra and (ix) Chedyādhyāya.

Manuscript reference:

TCC/TA. p. 45, 44 ff. Bengali. 1790 A.D.

KEŚAVĀNANDA.

Pañcāṅgamaṇimañjarī. पञ्चाङ्गमणिमञ्जरी

A tract useful for making almanacs.

Manuscript reference:

AS/HS & PS. x, *6879*, 2 ff. Bangali. 1812 A.D.

KEŚAVANĀTHA.

Siddhāntacintāmaṇi. सिद्धान्तचिन्तामणि

An astronomical work.

Manuscript reference:

OUDH (1890). p. 134, *138*, 38 ff. Nāgarī.

KEŚAVĀRKA.

Brahmatulya-sāra. ब्रह्मतुल्यसार

A commentary on the *Brahmatulya* of Bhāskarācārya.

Manuscript reference:

GUJARAT. iv. p. 168, *30*, 22 ff.

KEVALARĀMA.

Rekhāpradīpa. रेखाप्रदीप

Manuscript reference:

GUJARAT. iv. p. 188, *414*, 4 ff.

KEVALARĀMA PAÑCĀNANA.

1. *Gaṇitarāja.* गणितराज

A set of astronomical tables for computation of time in 10 chapters, *viz* (i) Sṛṣṭijñāna, (ii) Madhyasādhana, (iii) Deśāntarasādhana, (iv) Chāyāsādhana, (v) Sphuṭa, (vi) Pañcāṅgasādhana, (vii) Prakīrṇaka, (viii) Khaṇḍakathana, (ix) Grahaṇasādhana, (x) Grahasādhana. (?)

Manuscript reference:

IO/JE. v. *2963*, 54 ff. Bengali.

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2. *Grahacāra.* ग्रहचार
An astronomical work.
Manuscript reference:
IO/JE. v. *2965*, 68 ff. Bengali.
Commentator:
Rāma Kiṃkara Bhaṭṭācārya.

3. *Grahacarita.* ग्रहचरित
A work dealing with planetary movements.
Manuscript reference:
IO/JE. v. *2964*, 14 ff. Bengali.

Khaṇḍakhādya. see BRAHMAGUPTA s.o. Jiṣṇu.

Khaṇḍakhādyaka. see BRAHMAGUPTA s.o. Jiṣṇu.

Khaṇḍakhādyakapaddhati. see LALLA s.o. Bhaṭṭa Trivikrama.

Khaṇḍakhādya-karaṇa (*Udāharaṇa*). खण्डखाद्यकरण (उदाहरण)
c. 1758 A.D.
An anonymous astronomical work following the rules laid down in Brahmagupta's *Khaṇḍakhādya.*
Manuscript reference:
IO/JE. v. *2966*, 73 ff, Nāgarī. 1804 A.D.

Khaṇḍakhādyaka-vivaraṇa. see PṚTHŪDAKA SVĀMĪN s.o. Śrībhaṭṭa.

Khaṇḍakhādyakoṣṭhaka. खण्डखाद्यकोष्ठक
An anonymous work containing tables based on the *Khaṇḍakhādya* of Brahmagupta.
Manuscript reference:
ANUP. iv. p. 345, *95*, 24 ff.

Khaṇḍakhādyaṭīkā. see ŚRĪDAṬṬA.

Khecara-bhūṣaṇa. see BHĀNUJIT.

Khecara-kaumudī. see JAYARĀMA.

Khecaraśīghrasiddhi. see GAṄGĀDHARA s.o. Bhairava Datta.

Kheṭabodha. see KONERĪ.

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Kheṭabhūṣaṇa. see RĀMACANDRA.

Kheṭa-cintāmaṇi. खेटचिन्तामणि

Manuscript reference:
GUJARAT. iv. p. 120.

Kheṭa-kautuka. खेटकौतुक

An astronomical work abounding in Persian astronomical terms.

Manuscript reference:
CP/HL. p. 108, *1132.*

Kheṭakṛti. see RĀGHAVA.

Kheṭakutūhala. see SURAJIT.

Kheṭa-kutūhala. see SŪRIVIPRA.

Kheṭakutūhalodāhṛti. see VIŚVANĀTHA DAIVAJÑA. s.o. Divākara Daivajña.

Kheṭamuktāvalī. see NṚSIṂHA DAIVAJÑA. s.o. Rāma Daivajña.

Kheṭa-pañcāṅga. खेटपञ्चाङ्ग

An anonymous astronomical work helpful for calculating eclipses.

Manuscript reference:
BIK/RM. *673,* 10 ff. Nāgarī.
PU. ii. *3318,* 3 ff. Nāgarī; *3319,* 7 ff. Nāgarī.

Kheṭaplava. see KĀŚĪRĀJA.

Kheṭasiddhi. खेटसिद्धि

An anonymous astronomical work.

Manuscript reference:
OUDH. iv. p. 31, *1,* 12 ff. Nāgarī.

Kheṭasiddhi. see DINAKARA of Bārejya.

Kheṭatantra. खेटतन्त्र c. 1747-1807 A.D.

Manuscript reference:
MADRAS/D. xxiv. *13406,* 20 ff. Grantha & Telugu.

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Kheṭatantra. see NANDI SŪRI.
Kheṭataraṅgiṇī. see RAGHUNĀTHA.
Kṣetrasamāsa. see SOMATILAKA SŪRI.
Kiraṇāvalī, see DĀDĀBHĀI s.o. Mādhava Gāṃkara.

KODAṆḌARĀMA s.o. Veṅkaṭakṛṣṇa. (c. 1854 A.D.)

1. *Āryabhaṭatantraganita.* आर्यभटतन्त्रगणित c. 1854 A.D.
An astronomical work explaining the Kālakriyā chapter of the *Āryabhaṭiya.* It also contains astronomical tables.

Manuscript reference:
MADRAS/T. vol. i. part i. Sanskrit B, *371(o)*, ff. 138a-149b. Telugu.

2. *Daivajña-kalpalatā.* देवज्ञकल्पलता
An astronomical text with his own commentary. Mainly astronomical calculations in ten chapters.

Manuscript reference:
MADRAS/T. vol. vi. part i. Sanskrit, *5262a*, ff. 1a-105b, Telugu. 1869-70 A.D.

3. *Nakṣatra-vivaraṇa.* नक्षत्रविवरण
An astronomical pamphlet in which the author finds out the exact position of the planets and the celestial bodies from Bobbili, a village in Godavari District (Andhra). For this, he took the help of the *Sūryasiddhānta*, the *Āryabhaṭa Siddhānta*, the *Soma Siddhānta* and the *Siddhānta Śiromaṇi.*

Manuscript reference:
MADRAS/T. vol. i. part i. Sanskrit B, *371(h)*, ff. 77a-92b. Telugu.

KONERĪ

Kheṭabodha. खेटबोध
An astronomical work.

Manuscript reference:
GUJARAT. iv. p. 120, *43*, 7 ff. 1710 A.D.

KṚPĀRĀMA MIŚRA s.o. Lakṣmīnārāyaṇa and a resident of Ahmedabad. (c. 1792 A.D.)

1. *Bālabodhinī* or *Bījodāharaṇa* or *Bījagaṇitavivṛti* or *Bījagaṇitavyākhyā.* वालबोधिनी, बीजोदाहरण, बीजगणितविवृति, बीजगणितव्याख्या 1792 A.D.
A commentary on the *Bījagaṇita* of Bhāskarācārya.

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Manuscript reference:
BANARAS. p. 257, *107*, 96 ff.
BORS/AB. iii, *211*, 70 ff. Maithili. 1876 A.D.; three other Mss. *211A*, *211B*, *215*.
CSC/HS & SG. ix. *72*, 124 ff. Nāgarī. 1842 A.D.
IO/JE. v. *2833*, 140 ff. Nāgarī.
RORI/JM. ii. p. 102, *295*, 96 ff. 1894 A.D.

2. *Makarandakārikā* or *Makarandodāharaṇa*.
मकरन्दकारिका, मकरन्दोदाहरण 1817 A.D.
A commentary on the *Tithipatra* of Makaranda.
Manuscript reference:
AS/HS & PS. x. *6892*, 8 ff. Nāgarī. 1824 A.D.
NWP. i. p. 548, *116*, 45 ff. Nāgarī.
PU. ii. *3764*, 8 ff. Nāgarī. 1880 A.D.; *3774*, 32 ff. Nāgarī.
RORI/JM. ii. p. 104, *328*, 9 ff. 1867 A.D.

3. *Yantracintāmaṇyudāharaṇa*. यन्त्रचिन्तामण्युदाहरण
A commentary on the *Yantracintāmaṇi*. Several authors are known of this work ; the particular work of which it is a commentary could not be ascertained.
Manuscript reference:
NWP. i. p. 558, *150*, 80 ff. Nāgarī.

KṚPĀRĀMA MUKHOPĀDHYĀYA.
Aṅkādarśa. अङ्कादर्श
An arithmetical manual.
Manuscript reference:
NOTICES/HS. iv. p. 2. 3 ff. Bengali. 1864 A.D.

KṚPĀŚAṂKARA.
Jyotiṣa-kedāra. ज्योतिषकेदार
An astronomical work.
Manuscript reference:
CENSUS. *4676*, 46 ff. Nāgarī.

KṚṢṆA
Kṛṣṇīyam. कृष्णीयम्
In 31 chapters.
Manuscript reference:
VVRI/VB. p. 76, *3834*, 83 ff. Malayalam.

KṚṢṆA
Tithirāja. तिथिराज

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Manuscript reference:
PU. ii. *3539*, 5 ff. Nāgarī.

KṚṢṆA BHAṬṬĀCĀRYA s.o. Narasiṃha.

Jyautiṣa-grantha. ज्यौतिषग्रन्थ

An astronomical work in 9 chapters, *viz.*, (i) Jyotiśśāstra, (ii) Meru Praśaṃsā, (iii) Daivajña Lakṣaṇa, (iv) Rāja Praśaṃsā, (v) Pañcāṅga-praśaṃsā, (vi) Bha-cakrabhramaṇa, (vii) Kālanirṇaya, (viii) Caturyuga Pramāṇāni, (ix) Āyurbhuktinirṇaya.

Manuscript reference:
MADRAS/T. vol. iii. part i. Sanskrit B. *2596(e)*, ff. 137a-151a. Telugu.

KṚṢṆA DAIVAJÑA s.o. Ballāla (Early 17th. century)

Bījapallava or *Bījavivṛtikalpalatāvatāra* or *Kalpalatāvatāra* or *Bījanavāṅkura* or *Navāṅkura.* बीजपल्लव, बीजविवृतिकल्पलतावतार, कल्पलतावतार, बीजनवाङ्कुर, नवाङ्कुर

A commentary on the *Bījagaṇita* of Bhāskarācārya.

Manuscript reference:
ANUP. iv. p. 373, *4*, 166 ff.
AS/HS. & PS. x. *6885*, *149*, Nāgarī.
AS/KBK. p. 179, Bengali.
BM/CB. *449*, 48 ff. Nāgarī. 19th century.
BORS/AB. iii. *22*, 83 ff. Maithili; *22A*, 113 ff. Nāgarī; *22B*, 64 ff. Maithili; *217*, 105 ff. Maithili. 1856 A.D.
IO/JE. v. *2827*, ff. 86-71. Nāgarī.
PU. ii. *3679*.
RAS/BB/HV. *278*, 85 ff. Nāgarī.
RTL/MS. p. 166, *199*.
TANJORE/PPS. xvi. *11523*, 154 ff. Nāgarī.
VVRI/VB. p. 78, *2351*, 173 ff. Nāgarī; *2451*, 57 ff. Nāgarī, 1848 A.D.; *1170*, 6 ff. Nāgarī, incomplete; *2354*, 103. ff. Nāgarī, incomplete.

Printed text, translations etc.
Bijapallava. Ed. with introduction by T. V. Rādhākṛṣṇa Śāstrī. Tanjore Sarasvatī Mahal Series No. 78, Tanjore, 1958,
Bijapallava. Ānandāśrama Sanskrit Series, Poona.

2. *Chādakanirṇaya.* छादकनिर्णय

Manuscript reference:
BANARAS. p. 267, *107*, 5 ff.

Printed text, translations etc.
Published by Sudhākara Dvivedin, Banaras.

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KRṢṆA DAIVAJÑA s.o. Mahādeva (c. 1653 A.D.)

Karaṇakaustubha. करणकौस्तुभ 1653 A.D.

According to the author, this is a part of a bigger astronomical work called *Tantraratna,* composed at the instance of Shivaji. The other parts of this *Tantraratna* have not been noticed. His calculations agree with those of the *Grahakautuka* of Keśava Daivajña and the *Grahalāghava* of Gaṇeśa Daivajña.

Manuscript reference:

RAS/BB/HV. *222,* ff. 1-4, 12-24. Nāgarī.

Printed text, translations etc.

Karaṇakaustubha. Ed. by D. V. Apte, Ānandāśram Sanskrit Series No. 96, Poona, 1927.

KRṢṆA DAIVAJÑA.

Kalpalatā. कल्पलता

Manuscript reference:

CP/HL. p. 68, *727.*

KRṢṆA DAIVAJÑA.

Sūrya-siddhāntodāharaṇa. सूर्यसिद्धान्तोदाहरण

A commentary on the *Sūryasiddhānta.*

Manuscript reference:

BANARAS. p. 257, *87,* ff. 1-64.
BN/AC. i. *957(v),* Bengali. 1840 A.D.
M & C/LR. *338,* Nāgarī.

KRṢṆADATTA JHĀ

Cāpaprapañca. चापप्रपञ्च

A work on astronomy.

Manuscript reference:

BORS/AB. iii. *65,* 30 ff. Nāgarī.

KRṢṆA GAṆAKA.

Bījāṅkura. वीजाङ्कुर

A commentary on the *Bījagaṇita* of Bhāskarācārya.

Manuscript reference:

AS/KBK. p. 225, Bengali.
BANARAS. p. 257, *133,* ff. 129-172. 1832 A.D.
NWP. ii. p. 112, *4,* 45 ff. Nāgarī.; ix, p. 52, *39,* 120 ff. Nāgarī.
OUDH. xiii. p. 60, *6,* 260 ff. Nāgarī.

KRṢṆĀNANDA SARASVATĪ

Jaimini-sūtraṭīkā. जैमिनिसूत्रटीका

A commentary on the *Jaiminisūtra* of Jaimini.

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Manuscript reference:
GUJARAT. iv. p. 136, *128*, 67 ff.

KṚṢṆĀNANDA or BĀLAKṚṢṆĀNANDA or DRAVIḌĀ-CĀRYA.

Vāsanārasāyana. वासनारसायन

An astronomical work. It contains Mṛduvāsanā, Kheṭanāma dvitīya karma, Tṛtīya karma, Spaṣṭīkaraṇādhikāra, Pāṭasya Spaṣṭīkaraṇa, Deśāntara Vāsanādhikāra, Apakakhyāvāsanā and Sūryabhujaphalavāsanā.

Manuscript reference:
LEIPZIG/TA. *987*, 9 ff. 1822 A.D.

KṚṢṆARĀMA.

Kṛṣṇavinodasāraṇī. कृष्णविनोदसारणी

Astronomical tables.

Manuscript reference:
BU/GD. i, *340*, 19 ff. Nāgarī.

KṚṢṆARATHA

Grahacakravivaraṇa. ग्रहचक्रविवरण

A commentary on the *Grahacakra*, an anonymous astronomical work.

Manuscript reference:
NOTICES/HS. iv. p. 61, *80*, 76 ff. Uriya.

KṚṢṆARĀYAR.

Dṛggaṇita. दृग्गणित c. 1879 A.D.

An astronomical work giving details of information of Hindu calendars by means of direct observation of heavenly bodies.

Manuscript reference:
MADRAS/D. xxiv, *13429*, 810 ff. Telugu; *13430*, 148 ff. Telugu.

Kṛṣṇavinodasāraṇī. see KṚṢṆARĀMA

Kṛṣṇīya. see KṚṢṆA.

KṢEMAṄKARA.

Makarandaṭīkā or *Subodhikā.* मकरन्दटीका, सुबोधिका

A commentary on the *Tithipatra* of Makaranda.

Manuscript reference:
VVRI/VB. *2411*, 15 ff. Nāgarī. 1860 A.D.

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Kṣetragaṇita. see GAṆEŚA s.o. Śrīdhara.

Kṣetragaṇitaśāstra. क्षेत्रगणितशास्त्र
An anonymous work on geometry.

Manuscript reference:
TAYLOR. i, p. 34, *1670*, ff. 1-130. Telugu.

Kṣetraparibhāṣā. see NĪLĀMBARA JHĀ.

Kṣetrasādhanā. see DIVĀKARA.

Kṣetrasamāsa. see JINABHADRA GAṆI.

Kṣetrasamāsa or *Kṣetrasamāsaprakaraṇa* or *Khettasamāsa*, *Jambūdvīpasamāsa* or *Jambūdvīpakṣetrasamāsa* or *Jambūdvīpakṣetrasamāsaprakaraṇa.* क्षेत्रसमास, क्षेत्रसमासप्रकरण, खेत्तसमास, जम्बूद्वीपसमास, जम्बूद्वीपक्षेत्रसमास, जम्बूद्वीपक्षेत्रसमासप्रकरण
A Jaina Prākṛt work on Geometry.

Manuscript reference:
AS/KBN. *2605*; *4309*.
GOS/21. p. 34, *265*(*2*), 71 ff.
GOS/76. *11* (*2*), ff. 74-86; *15* (*25*), ff. 272-278; *21* (*4*), ff. 65-70; *39* (*4*), ff. 107-118; *50* (*5*), ff. 89-98; *53* (*9*), ff. 85-92; *58* (*5*), ff. 102-109; *62* (*8*), ff. 81-88; *73* (*7*), ff. 262-265. incomplete; *74* (*5*), ff. 264-268, *103* (*4*), ff. 95-104; *105* (*3*), ff. 123-129; *128* (*3*), 8 ff.; *133* (*4*), ff. 70-76; *149* (*2*), ff. 20-28; *155*, ff. 180-188; *255* (*4*), ff. 70-76; *261* (*7*), ff. 199-212.
GOS/135. *88* (*9*), ff. 159-164; *90* (*6*), ff. 145-151; *99* (*3*), ff. 65-73; *101* (*5*), ff. 117-127. 1251 A.D.; *105*(*6*), ff. 135-144; *107* (*1*), 9 ff. *110* (*2*), ff. 84-94; *112* (*3*), ff. 121-132; *113* (*5*), ff. 113-120; *118* (*12*), ff. 188-195.

Kṣetrasamāsa-prakaraṇa. see ŚRĪCANDRA SŪRI

Kṣetrasamāsaṭīkā. see MALAYAGIRI SŪRI

Kṣetrasamāsāvacuri. see GUṆARATNA SŪRI.

Kṣetrasamāsavārtika. क्षेत्रसमासवार्तिक

Manuscript reference:
AS/KBN. *6632*; *6640*.

Kṣetrasamāsavṛtti. क्षेत्रसमासवृत्ति
A commentary on the *Kṣetrasamāsa.*

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Manuscript reference:
GOS/21. p. 6, *43*, ff. 2-341.
RORI/JM. ii. possesses two copies of Mss both incomplete.

Kṣetratattva-pradīpikā. see YOGADHYĀNA MIŚRA.

Kṣetravicāra. क्षेत्रविचार

Manuscript reference:
AS/KBN. *7546.*

KUBERA MIŚRA.

Bhāsvatīvyākhyā. भास्वतीव्याख्या

A commentary on the *Bhāsvatī* of Śatānanda.

Manuscript reference:
IO/JE. v. *2919*, ff. 1-34, Nāgarī. 1811 A.D.

Kujādigrahacāraganita. कुजादिग्रहचारगणित

An anonymous astronomical work full of tables.

Manuscript reference:
MADRAS/T. vol. iii. part i. Sanskrit C, *2841*, 42 ff. Telugu.

Kujādipañcagrahavākya. कुजादिपञ्चग्रहवाक्य

An anonymous work; contains tables only.

Manuscript reference:
MADRAS/D. xxiv, *13400*, 50 ff. Grantha; *13401*, 83 ff. Grantha; *13402*, 92 ff. Grantha.
MADRAS/T. vol. iv. part i. Sanskrit C, *3952*(*b*), ff. 44a-69b. Grantha.
RAS/MW. *68*(*z*), 53 ff. Grantha.

Kulabhāsya. कुलभाष्य

An anonymous commentary on the *Karaṇakutūhala* of Bhāskarācārya.

Manuscript reference:
RORI/JM. ii. p. 102, *285*, 52 ff. 19th. century.

KUMĀRATANAYA YOGIN.

Sūryasiddhānta-sphuṭādhyayana-vyākhyāna.
सूर्यसिद्धान्तस्फुटाध्ययनव्याख्यान

A commentary on Sphuṭa chapter of the *Sūryasiddhānta.*

Manuscript reference:
MAC/HW. p. 163, *12*. Grantha.

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Kūpikā.

An anonymous commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

NWP. v. p. 88, *11*, 102 ff. Nāgarī.

Kuṭṭākāra-śiromaṇi. see DEVARĀJA s.o. Varadācārya.

Kuṭṭākāraśiromaṇi. see VEṄKATĀDRI.

Kuṭṭākāraśiromaṇi-ṭīkā. कुट्टाकारशिरोमणिटीका

An anonymous commentary on the *Kuṭṭākāraśiromaṇi* of Veṅkaṭādri.

Manuscript reference:

TANJORE/PPS. xvi, *11354*, 54 ff. Grantha.

Kuṭṭākāraśiromaṇiṭīkā. see DEVARĀJA s.o. Varadācārya.

LAGADHA or Lagaṭa.

Vedāṅga-jyautiṣa or Jyotiṣa-vedāṅga. वेदाङ्गजौतिष, ज्योतिषवेदाङ्ग

The earliest Indian work on astronomy available in two recensions i.e., *ṚK* and *Yajus*, attributed to Lagadha.

Manuscript reference:

ṚK-Recension:

BERLIN. i, *372*, 4 ff. 1772 A.D.
RAS/BB/HV. *214*, 4 ff. Nāgarī. 1791 A.D.
TCC/TA. p. 32, 5 ff. Nāgarī. 1801 A.D.

Yajus-Recension:

BERLIN. i. *374*, ff. 4b-8b; *375*, ff. 4b-9a; ii. part i; *1505*, Nāgarī.
IO/JE. v. *2765*, 72 ff. Nāgarī.
MADRAS/D. xxiv, *13425*, 55 ff. Grantha & Tamil.
TANJORE/AB. p. 75.

Recension not known:

AS/KBK, p. 69, Nāgarī.
BM/CB. *435*, 2 ff. Nāgarī. 18th. century.
BN/AC. i. *322* (*11*), ff. 1-5b; *968* (*v*), Bengali. 1840 A.D.; *971*, 140 ff. Grantha. 17th. century.
CENSUS. *325*, 6 ff. Nāgarī.
GUJARAT. i. p. 202, *30*, 11 ff.
MYSORE/AM. p. 50, *1354*, 13 ff. Telugu.
PU. i. *57*, ff. 6-8, Nāgarī, 1793 A.D; *58*, ff. 5-9, Nāgarī. 1756 A.D.; *59*, ff. 6-10, Nāgarī; *60*, ff. 2-19, Nāgarī.
UJJAIN. p. 8, *1821*, 8 ff.; *1970*, 6 ff. 1854 A.D.
ZDMG/42. p. 539, *50*, 24 ff.; p. 553, 11 ff.

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Commentator:

Somākara.

Printed text, translations etc.

Über den Veda-Kalender, Namens *Jyotisham* von A. Weber. *Abhandlungen der Koniglichen Akademie der Wissenshaften zu Berlin.* 1862.

Jyotiṣavedāṅga. Some original passages are reproduced by G. Thibaut, in his paper "Contributions to the explanation of the Jyotiṣa-Vedāṅga," *JASB*, **46,** 1877.

Jyotiṣa, a system of astronomy, connected with the schools of the *Ṛg-veda* and *Yujur-veda.* A revised text prepared by Lālā Choṭelāl (Bārhaspatya Kavi) with verbal analysis and notes. Published by A. Weber with a preface by Jagannātha Tripāṭhi of Jhansi. Allahabad. 1960. A reprint with English translation of the paper published in the *Hindustan Review* by Bārhaspatya. Allahabad. 1907.

Yājusajyotiṣa with the *Bhāṣya* of Somākara Śeṣa and Sudhākara Dvivedin and *Ārcajyotiṣa* with the *Bhāṣya* of Sudhākara Dvivedin and Muralidhara Jha's explanatory notes. Ed. by Sudhākara Dvivedin. Bombay, 1908.

Vedāṅgajyotiṣa. Ed. with English translation and Sanskrit commentary by R. Shamasastri. Mysore, 1936.

Study:

DAS, SUKUMAR RANJAN. 'Astronomical instruments of the Hindus,' *IHQ*, **4,** 256-269, 1928.

DAS, SUKUMAR RANJAN. 'Jaina School of Astronomy,' *IHQ*, **8,** nos. 1 & 3, 30-42 & 565-570, 1932.

FLEET, J. F. 'The Ancient Indian water clock', *JRAS*, 213-230, 1915.

KAYE, G. R. *Hindu Astronomy*, *ASI/M*, **18,** 5, 7, 17-19, 21, 27, 30, 34, 57, 95, 120, Calcutta, 1924.

THIBAUT, G. 'Contributions to the explanation of Jyotiṣa Vedāṅga,' *JASB*, **46,** part i, 411-37, 1877.

WEBER, A. 'Über den Veda-Kalender, Namens Jyotisham', *TRASB*, 1862.

WINTERNITZ, M. *Geschichte der indischen Litteratur*, **3,** 556, Leipzig, 1922.

Lagata. see LAGADHA.

Laghubhāskarīya. see BHĀSKARA I

Laghubhāskarīyavyākhyā. see PARAMEŚVARA.

Laghucintāmaṇi. see GAṆEŚA DAIVAJÑA s.o., Keśava Daivajña.

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Laghucintāmaṇisāriṇī. लघुचिन्तामणिसारिणी

An anonymous work containing mainly tables illustrating calculations of the *Laghucintāmaṇi* of Gaṇeśa Daivajña.

Manuscript reference:

RAS/BB/HV. *241*, 44 ff.

Laghucintāmaṇiṭīkā. लघुचिन्तामणिटीका

An anonymous commentary on *Laghucintāmaṇi* of Gaṇeśa Daivajña.

Manuscript reference:

BU/GD. ii, *2330*, 23 ff. Nāgarī.

Laghucintāmaṇivivaraṇa. लघुचिन्तामणिविवरण

An anonymous commentary on the *Laghucintāmaṇi* of Gaṇeśa Daivajña.

Manuscript reference:

BU/GD. i. *355*, 8 ff. Nāgarī. 1877 A.D.

Laghudīpikā. see SUNDARARĀJA s.o. Anantanārāyaṇa.

Laghukaraṇa. see SADĀŚIVA BHAṬṬA.

Laghukhecarasiddhi. see ŚRĪDHARĀCĀRYA.

Laghukheṭasiddhi. see DINAKARA of Bārjeya.

Laghukṣetrasamāsa-vivaraṇa. see CANDRAŚEKHARA.

Laghukṣetrasamāsavṛtti. see HARIBHADRA SŪRI.

Laghumānasa. see MAÑJULĀCĀRYA.

Laghumānasagaṇitavyākhyā. see PARAMEŚVARA.

Laghumānasakalpalatā. see YALLAYA.

Laghumānasodāharaṇa. see PRAKĀŚĀDITYA.

Laghuprakāśikā. see SUNDARARĀJA s.o. Anantanārāyaṇa.

Laghusaṃgraha. see LAKṢMĪNĀRĀYAṆA.

Laghusubodha (*Grahaganita*). लघुसुबोध, (ग्रहगणित)

Manuscript reference:

MYSORE/AM. p. 50. 12 ff. 36-41. Nāgarī.

Laghutithicintāmaṇi. see GAṆEŚA DAIVAJÑA

Laghutithicintāmaṇi-sāriṇī. लघुतिथिचिन्तामणिसारिणी

An anonymous work.

Manuscript reference:

PU. *3536*, 14 ff.

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Laghutithicintāmaṇi-udāharaṇa. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

Laghu-vaśiṣṭha Siddhānta. see VAŚIṢṬHA.

Laghuvimarṣiṇī. लघुविमर्षिणी

An anonymous commentary on the *Līlāvatī* of Bhāskar ācārya.

Manuscript reference:

PU. ii. *3923*, ff. 34-77, Tamil; *3924*, ff. 58-79, Nāgarī.

LAKṢMAṆA.

Jyotiḥpradīpikā. ज्योतिःप्रदीपिका

A commentary on the *Jaiminisūtra* of Jaimini.

Manuscript reference:

HULTZSCH. i. *662a*, 61 ff. Telugu.
MADRAS/T. vol. v. part i. Sanskrit A, *4248a*, ff. 4a-23b. Grantha.
TRI/KS. iv. *82*, Malayalam.

LAKṢMĪDĀSA s.o. Vācaspati Miśra s.o. Keśava. (c. 1501 A.D.)

Gaṇitatattvacintāmaṇi. गणिततत्त्वचिन्तामणि c. 1501 A.D.

A commentary on the *Siddhāntaśiromaṇi* of Bhāskarācārya.

Manuscript reference:

AS/KBK. p. 225, Bengali.
BERLIN. i. *843*, 298 ff. 1501 A.D.
BIK/RM. *632*, 480, Nāgarī.
BN/AC. i. *958* (*1*), Bengali.
BORS/AB. iii, *38*, 60 ff. Maithili. 1842 A.D.
CP/FK. p. 228, *46*, 98 ff.
CSC/HS & SG. ix. p. 164, *172*, 673 ff. Bengali. 1723 A.D.
GUJARAT. iv. p. 122, *48*, 469 ff.; p. 208, *523*, 175 ff.
IO/JE. v. *2851*, ff. 208-65, Nāgarī.
OUDH. xii. p. 22, *2*, 246 ff. Nāgarī.
RAS/BB/HV. *287*, Nāgarī. 1596 A.D.
RTL/MS. p. 175, 403 ff. Kasmiri.
TCC/TA. p. 51, 365 ff. Nāgarī. 1600 A.D.; p. 55, 12 ff. Bengali. 1810 A.D.; p. 54, 46 ff. Bengali. Beginning of the 18th. century A.D.; p. 54, 10 ff. Bengali. End. of 17th. century A.D.
VVRI/VB. 82 ff. Nāgarī. 1844 A.D.

LAKṢMĪDHARA s.o. Vaijadeva.

Śīghrasiddhi. शीघ्रसिद्धि

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An astronomical work used for calculating lunar days. 4 chs. *viz.*, (i) Tithidhruvādisiddhi, (ii) Abhīṣṭamāseṣṭatiśyādisiddhi, (iii) Dinapārapravṛttisiddhi, (iv) Natakoṣṭasiddhi.

Manuscript reference:

BM/CB. *466*, 38 ff. Nāgarī. 1622 A.D.

LAKṢMĪNĀRĀYAṆA.

Laghu-saṃgraha. लघुसंग्रह

An astronomical treatise.

Manuscript reference:

NOTICES/RM. viii, *2875*, 31 ff. Nāgarī.

Printed text, translations etc.

Published with Hindi translation, Benares, 1911.

LAKṢMĪNĀTHA.

Lakṣmīnāthī. लक्ष्मीनाथी

A commentary on the *Siddhāntaśiromaṇi* of Bhāskarācārya.

Manuscript reference:

NWP. viii. p. 57, *18*, 59 ff. Nāgarī; ix, p. 46, *7*, 117 ff. Nāgarī.

Lakṣmīnāthī. see LAKṢMĪNĀTHA.

LAKṢMĪPATI. (1740 A.D.)

1. *Dhruva-bhramaṇa.* ध्रुवभ्रमण

An astronomical work on the stability or instability of the polar star.

Manuscript reference:

NWP. i. p. 522, *46*, 15 ff. Nāgarī.

2. *Samrāt-yantra.* सम्राट्यन्त्र

An astronomical instrument.

Manuscript reference:

NWP. i. p. 560, *156*, 5 ff. Nāgarī.

3. *Ṣoḍaśa-yoga-vyākhyāna.* षोडशयोगव्याख्यान

Translated from Arabic into Sanskrit. It describes the 16 Yogas, *viz.*, Ikkavala etc. Ikkavala is equivalent to Arabic Iqbāl.

Manuscript reference:

NWP. i. p. 532, *76*, 80 ff. Nāgarī.

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LALLA s.o. Bhaṭṭa Trivikrama. (c. 638 A.D. or c. 768 A.D.*)

1. *Dhīvṛddhidatantra* or *Śiṣyadhīvṛddhida* (*Mahātantra*). धीवृद्धिदतन्त्र, शिष्यधीवृद्धिद (महातन्त्र)

An astronomical work containing various calculations in 14 chs. *viz.*, (i) Gatisādhanādhyāya, (ii) Tithyānayanādhikāra, (iii) Spaṣṭīkaraṇādhyāya, (iv) Chāyādhikāra, (v) Candragrahaṇādhikāra, (vi) Sūryagrahaṇādhikāra, (vii) Parvānayanādhikāra, (viii) Udayāstādhikāra, (ix) Candrachāyādhikāra, (x) Śṛṅgonnatyadhikāra (xi) Grahayutyadhikāra (xii) (?) (xii) Pātasādhanādhikāra, (xiv) Uttarādhikāra. It is based on the *Āryabhaṭīya* of Āryabhaṭa.

Manuscript reference:

BERLIN. ii. part i, *1732*, 29 ff.

BU/GD. i, *360*, 19 ff. Nāgarī; *361*, 14 ff. Nāgarī. 1864 A.D.

LU. *126*.

NWP. viii. p. 54, *6*, 143 ff. Nāgarī.

Printed text, translations etc.

Śiṣyadhīvṛddhida. Ed. by Sudhākara Dvivedin, Benares, 1886.

Study:

CHATTERJEE, BINA. 'Geometrical interpretation of the motion of the Sun, Moon and the five planets as found in the mathematical syntaxis of Ptolemy and in the Hindu astronomical works', *JASB*, xv, 47-87, 1949.

SINGH, A. N. 'Hindu Trigonometry', *PBMS*, no. 1, 77-92, 1939.

WINTERNITZ, M. *Geschichte der indischen Litteratur*, **3**, 563, Leipzig, 1922.

2. *Khaṇḍakhādyaka-paddhati*. खण्डखाद्यकपद्धति

A commentary on Brahmagupta's *Khaṇḍakhādyaka*. It may be questioned if the author of *Śiṣyadhīvṛddhida* is also the author of this commentary. P. C. Sengupta (*Khaṇḍakhādyaka*, Eng. translation, C. U. 1934, p. xxiv-xxvii) thinks that these two works are by the same author. See also the edition of *Khaṇḍakhādyaka* with Āmarāja's commentary *Vāsanā-bhāṣya* (C.U. 1925) by Pt. Babua Misra.

LALLA LAKṢMAṆA.

Daivajñavilāsa. दैवज्ञविलास

Used for preparing calendars. It has four main khaṇḍas viz., (i) Utpātakhaṇḍa, (ii) Kālakhaṇḍa, (iii) Karmakhaṇḍa, (iv) Rājanītikhaṇḍa. Only Utpātakhaṇḍa and Kālakhaṇḍa deal with astronomy and the rest with astrology. Utpātakhaṇḍa covers chs. 1-63 and Kālakhaṇḍa covers chs. 64-77.

*Sengupta, P. C. *Khaṇḍakhādyaka*, Introduction, xxvi, Calcutta, 1934.

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Manuscript reference:

MADRAS/D. xxiv. *13434*, 29 ff.; *13435*, 61 ff. Telugu; *13436*, 48ff. Telugu; *13437*, 359 ff. Telugu.

MADRAS/T. vol. i. part i. Sanskrit B, *421*, ff. 3a-247b, Telugu; vol. iii. part i. Sanskrit A, *2228*, 97 ff. Telugu; vol. iii. part i, Sanskrit C, *2341*, 128 ff. Telugu. 1916-17 A. D.

Lāṭādipañcaka: Laghuvṛttisahita. लाटादिपञ्चक लघुवृत्तिसहित

An anonymous work on Astronomy.

Manuscript reference:

MADRAS/T. vol. iii. part i. Sanskrit C, *2754* (*b*), ff. 212a-214b, Nāgarī.

Līlāvatī. see BHĀSKARĀCĀRYA s.o. Maheśvara.

Līlāvatīlakṣaṇa. see DHANEŚVARA s.o. Vīreśvara.

Līlāvatī-kaṭākṣa. लीलावतीकटाक्ष

An anonymous commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

BORS/AB. iii. *321*, 43 ff. Maithili.

Līlāvatīpāṭīkaṭīkā. see GAṄGĀDHARA s.o. Govardhana.

Līlāvatīprakāśa. लीलावतीप्रकाश

An anonymous commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

BN/AC. i. *938*, 162 ff. Bengali. 1609 A.D.; *986*, 160 ff. Bengali. 1609 A.D.

Līlāvatīṭīkā. see MOṢADEVA s.o. Bhīmadeva.

Līlāvatīṭīkā. see RĀMAKṚṢṆA s.o. Lakṣmaṇa.

Līlāvatīṭīkā. see RĀMEŚVARA MIŚRA s.o. Maṇirāma Miśra.

Līlāvatīṭīkā. see ŚRĪKṚṢṆA.

Līlāvatīṭīkā. see SŪRYAMAṆI s.o. Tripāṭhī Ghanaśyāma.

Līlāvatīṭīkā. see VṚNDĀVANA ŚUKLA.

Līlāvatīṭīkā. लीलावतीटीका

An anonymous commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

LU. *45.*

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Līlāvatīṭippaṇa. see RĀMADATTA.

Līlāvatī-udāharaṇa. लीलावतीउदाहरण

An anonymous commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:
PU. ii. *3925*, ff. 17-62, Nāgarī.

Līlāvatīvilāsa. see RAṄGANĀTHA.

Līlāvatīvilāsa. see DEVĪSAHĀYA s.o. Kṛṣṇakaura.

Līlāvatī-vilāsa. लीलावतीविलास

An anonymous commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:
MADRAS/T. vol. iv. part i. Sanskrit C, *3938*, 50 ff. Grantha; vol. x. Sanskrit A, *6485*, ff. 1-48b. Nāgarī. 1937 A.D.

Līlāvatīvivaraṇa. see MAHĪDĀSA.

Līlāvatīvivaraṇa. see MAHĪDHARA.

Līlāvatīvivaraṇa. see PARAŚURĀMA.

Līlāvatīvivaraṇa. see RĀMAKṚṢṆA DEVA s.o. Sadāśiva Āpadeva.

Līlāvatīvivaraṇa. लीलावतीविवरण

An anonymous commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:
OUDH. p. 104, *7*, 12 ff. Nāgarī; p. 126, *103*, 86 ff. Nāgarī.

Līlāvatī-vivṛti. लीलावतीविवृति

An anonymous commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:
CENSUS. p. 236, *4762*, ff. 1-78, Nāgarī.

Līlāvatīvivṛti. see GAṆEŚA DAIVAJÑA s.o. Keśava Daivajña.

Līlāvatīvṛtti. see RĀMAKṚṢṆA s.o. Lakṣmaṇa.

Līlāvatīvyākhyā. लीलावतीव्याख्या

An anonymous commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:
MADRAS/T. vol. i. part i. Sanskrit A, *338*, 36 ff. Telugu.

Līlāvatīvyākhyā. see AHOṢAKA DEVA.

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Līlāvatīvyākhyā. see KĀMA.

Līlāvatīvyākhyā see KEŚAVA.

Līlāvatīvyākhyā. see PARAMEŚVARA.

Līlāvatīvyākhyā. see RĀMA.

Līlāvatīvyākhyā. see SŪRYA.

Līlāvatyudāharaṇa. see CANDRAŚEKHARA PAṬANĀYAKA.

Līlāvatyudāharaṇa. see NĪLĀMBARA JHĀ.

Līlāvatyudāharaṇa. see VĪREŚVARA.

Līlāvatyudāharaṇa. see VIŚVEŚVARA.

Līlāvatyupapatti. see NĪLĀMBARA JHĀ.

Lohagōlākhaṇḍaṇa. see RAṄGANĀTHA s.o. Nṛsiṃha Daivajña.

Lōkabhāskara. लोकभास्कर

Manuscript reference:
CP/FK. p. 240, *145*, 41 ff. 1802 A.D.

Lokabhāskaraṭīkā. see LOKANĀTHA.

LOKANĀTHA.

Lokabhāskaraṭīkā. लोकभास्करटीका

Manuscript reference:
NU/VK. p. 393, 41 ff. Nāgarī. 1802 A.D.

Lokasāra Yantra. see AJITADEVA SŪRI.

MADANAPĀLA, a king of Ṭāka family (c. 1374 A.D.)

Vāsanārṇava. वासनार्णव

A commentary on the *Sūryasiddhānta.* In this commentary Brahmagupta and Bhāskarācārya are often criticised. There are references to the author's other works on astronomy i.e., *Siddhāntagarbha* or *Madanavinoda* and *Yantraprakāśa* in this commentary, but no MSS of these two works are noticed. Madanapāla does not comment on the portion of the *Sūryasiddhānta* up to *Golādhyāya*, as it is virtually commented upon in his work, *Siddhāntagarbha.*

Manuscript reference:
RAS/BB/HV. *294*, 48 ff. Nāgarī. 1537 A.D.

Madanavinoda. see MADANAPĀLA.

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MĀDHAVA.

1. *Bhāsvatīṭīkā.* भास्वतीटीका

A commentary on the *Bhāsvatī* of Śatānanda.

Manuscript reference:

AS/KBK. p. 133, Nāgarī.

VVRI/VB. *2537*, 41 ff. Nāgarī. 1928 A.D.

Printed text, translations etc.

Bhāsvatī Udāharaṇa. Benares Litho, Ganesh Prabhakara Press, 1885 A.D.

2. *Karmapradīpikā.* कर्मप्रदीपिका

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

MADRAS/T. vol. iv. part i. Sanskrit B, *3497*, 59 ff. Grantha.

MĀDHAVA.

Mahādevīṭīkā. महादेवीटीका

A commentary on the *Mahādevī* of Mahādeva Bhaṭṭa.

Manuscript reference:

GUJARAT. iv. p. 172, *326*, 9 ff.; p. 172, *325*, 28 ff.

MĀDHAVĀCĀRYA.

1. *Kālanirṇaya.* कालनिर्णय

An astronomical treatise.

Manuscript reference:

ZDMG/42. p. 549, *266*, 189 ff.

2. *Sūryasiddhāntaṭīkā.* सूर्यसिद्धान्तटीका

A commentary on the *Sūryasiddhānta.*

Manuscript reference:

NWP. i. p. 526, *58*, 53 ff. Nāgarī.

MADHUSŪDANA s.o. Murāri Śukla.

Subodhinī. सुबोधिनी

A commentary on the *Bhāsvatīkaraṇa* of Śatānanda.

Manuscript reference:

IO/JE. v. 2919, ff. 82a-106a. Nāgarī. 1811 A.D.

Madhyagrahavākyāni. मध्यग्रहवाक्यानि

An anonymous astronomical work.

Manuscript reference:

MYSORE/AM. p. 50, *212*, 63 ff. Nāgarī.

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Mahābhāskarīya. see BHĀSKARA I.

Mahābhāskarīya-bhāṣya. see GOVINDA SVĀMIN

Mahābhāskarīya-vyākhyā. महाभास्करीयव्याख्या
An anonymous commentary on the *Mahābhāskarīya* of Bhāskara I.

Manuscript reference:
MADRAS/T. iii. part i. Sanskrit A. *3034*, 41 ff. Nāgarī.

MAHĀDEVA.

Grahalāghavodāharaṇa. ग्रहलाघवोदाहरण
A commentary on the *Grahalāghava* of Gaṇeśa Daivajña.

Manuscript reference:
TANJORE/PPS. xvi. *11371*, 16 ff. Nāgarī.

MAHĀDEVA.

1. *Grahasiddhi.* ग्रहसिद्धि
A treatise helpful for solving planetary problems.

Manuscript reference:
RORI/JM. ii. *4892*, 3 ff. 18th. century.

2. *Grahaspaṣṭīkaraṇa Koṣṭhaka.* ग्रहस्पष्टीकरण कोष्ठक

Manuscript reference:
RAS/BB/VM. xlvi. ff. 2-14.

MAHĀDEVA s.o. Hirāmaṇi s.o. Heramba. (c. 1783 A.D.)

Jyotiścandrārka. ज्योतिश्चन्द्रार्क c. 1783 A.D.
An astronomical work.

Manuscript reference:
RORI/JM. ii. *4669*, 51 ff. 1836 A.D.

MAHĀDEVA s.o. Vopadeva. (c. 1356 A.D.)

Tithyādikāmadhenu. तिथ्यादिकामधेनु
An astronomical work.

Manuscript reference:
RAS/BB/HV. *242*, 11 ff. Nāgarī.

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MAHĀDEVA BHAṬṬA s.o. Paraśurāma, grandson of Padmanābha and a resident of Rāsiṇa on the banks of the Godāvarī (c. 1316 A.D.)

Mahādevī or *Mahādevīsāriṇī* or *Mahādevī-koṣṭhaka* or *Grahasiddhi*. महादेवी, महादेवीसारिणी, महादेवीकोष्ठक, ग्रहसिद्धि 1316 A.D.

According to the first stanza, this work was started by an astronomer called Cakreśvara and then the incomplete work was carried on to its completion by Mahādeva. This contains 43 verses. They describe the methods of calculating only the mean and true places of the planets. The epochal positions are given for the mean Aries Ingress and the work contains tables for calculating the mean places of planets from *Varṣagaṇa*, which simplifies the calculation. It has given the positions of and motions of the planets as in the *Brahmasiddhānta* of Brahmagupta, after applying the corrections mentioned by the Rājamṛgāṅka.

Manuscript reference:

CENSUS. *4766*, 137 ff. Nāgarī; *4767*, ff. 1, 3-7, Nāgarī; *4768*, 5 ff. Nāgarī, 1816 A.D.
GUJARAT. iv. p. 172, *323*, 6 ff.
RAS/BB/HV. *254*, 30 ff. Nāgarī.
RORI/JM. ii. p. 105, *344*, 91 ff. 19th. century; *345*, 126 ff. 1814 A.D.; *346*, 52 ff. 1848 A.D.

Commentators:

Dhanarāja and Mādhava.

MAHĀDEVA BHAṬṬA.

Sārasaṃgraha. सारसंग्रह

Manuscript reference:

GUJARAT. iv. p. 206, 510 ff.

Mahādevī. see MAHĀDEVA BHAṬṬA s.o. Paraśurāma.

Mahādevīkoṣṭhaka. see MAHĀDEVA BHAṬṬA s.o. Paraśurāma.

Mahādevīkoṣṭhaka. महादेवीकोष्ठक

Manuscript reference:

GUJARAT. iv. p. 172.

Mahādevīsāriṇī. see MAHĀDEVA BHAṬṬA s.o. Paraśurāma.

Mahādevīṭīkā. see MĀDHAVA.

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Mahādevīvṛttadīpikā. see DHANARĀJAGAṆI.

Mahālakṣmīmuktāvalī. see DEVARĀJA s.o. Varadācārya.

MAHĀRĀJA.

Gaṇita-śāstra. गणितशास्त्र

A work on Mathematics.

Manuscript reference:

TAYLOR. i. p. 315, *1548.*

Mahāsiddhānta. see ĀRYABHAṬA II.

Mahāsiddhāntaṭīkā. see SUDHĀKARA DVIVEDIN.

Mahāvākyāni. महावाक्यानि

Manuscript reference:

MYSORE/AM. p. 50. *28*, ff. 6-25. Nāgarī.

MAHĀVĪRĀCĀRYA. (c. 850 A.D.)

Gaṇitasārasaṃgraha. गणितसारसंग्रह c. 850 A.D.

A Jaina work on Arithmetic in 5 chapters, *viz.*, (i) Parikramavidhi, (ii) Kalāsavarṇa vyavahāra, (iii) Prakīrṇakāvyavahāra, (iv) Trairāśikavyavahāra, (v) Vargasaṃkalitānayanasūtra and Ghanasaṃkalitānayanasūtra.

Manuscript reference:

HULTZSCH. i. *309*, 90 ff. Telugu.
IO/AK. ii. part i. p. 782, *6320*, 76 ff. Kanarese. 1800 A.D.; p. 783, *6321*, 116 ff. Kanarese. 1800 A.D.
IO/JE. v. *2880*, 82 ff. Nāgarī. 1577 A.D.
JSB/SD. p. 8, *180*, 28 ff. Kanarese; *181*, 113 ff. Kanarese.
KANNADA. *327*, 135 ff. Kanarese; *613*, 57 ff. Kanarese; *638*, 29 ff. Kanarese; *677*, 101 ff. Kanarese; *873*, 64 ff. Kanarese.
M & C/LR. *2880*, Kanarese.
MADRAS/D. xxiv. *13408*, 105 ff.; *13409*, 34 ff.; *13410*, 50 ff. Kanarese; *13411*, 56 ff. Kanarese.
MYSORE. p. 49, *A58*, 204 ff. Kanarese.
RAS/BB/HV. *229*, 59 ff. Nāgarī.
RAS/BB/VM. p. xxix. 59 ff.
TAYLOR. i. p. 211, *1342*, 60 ff. Telugu.

Commentators:

Varadarāja.

Printed text, translation etc.

Gaṇitasārasaṃgraha, with English translation and notes by Raṅgācārya, xxiv + 158 (text) + 325 (Eng. trans), Madras, 1912.

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Study:

BELL, E. T. 'Mahāvīra's Diophantine System', *BCMS*, **28,** 121-122, 1946.

CAJORI, F. *History of Mathematics*, 2nd. revised and enlarged edition, 85-86, 88, 96, 97, New York, 1958.

CHAKRABARTY, GURUGOVINDA. 'On the Hindu treatment of fractions', *JDL/CU*, **24,** 59-76, 1934.

CHAKRABARTY, GURUGOVINDA. 'Typical problems of Hindu Mathematics', *ABORI*, **14,** 87-102, 1933.

CHAKRABARTY, GURUGOVINDA. 'Growth and development of permutation and combination in India', *BCMS*, **24,** 79-88, 1932.

CHAKRABARTY, GURUGOVINDA. 'The growth and development of progressive series in India', *JDL/CU*, **24,** 1-18, 1934.

DATTA, BIBHUTIBHUSAN. 'On Mahāvīra's solution of rational triangles and quadrilaterals', *BCMS*, **20,** 267-94, 1930.

DATTA, B. 'Geometry in the Jaina cosmography', *QJSGM*, Sec. B. **1,** 245-54, 1930.

DATTA, B. 'The Jaina School of Mathematics', *BCMS.*, **21,** 115-45, 1929.

NEEDHAM, J. *Science and Civilisation in China.* **3,** 35, 88, 91, 119 (b), 147, Cambridge, 1954.

ROY, D. M. 'The Culture of Mathematics among the Jainas of Southern India in the Ninth century', *ABORI*, **8,** 145-147, 1927.

SARASVATI, T. A. 'Śreḍhīkṣetras or diagrammatical representations of Mathematical series', *JORM*, **28,** no. 1-4, 74-85, 1961.

SINGH, AVADESH NARAYAN. 'On the Indian method of root extraction', *BCMS*, **18,** 123-40, 1927.

SARTON, GEORGE. *Introduction to the History of Science*, 1, 546, 549, 570. Reprint 1950.

SMITH, D. E. *History of Mathematics*, **1,** 152, 154. 161; **2,** 380, 387, 445, Dover edition, 1958.

SMITH, D. E. '*Gaṇita-sāra-saṃgraha* of Mahāvīrācārya,' *BM*, **3,** 106-110, Leipzig, 1908-9.

WINTERNITZ, M. *Geschichte der indischen Litteratur*, **3,** 575, Leipzig, 1922.

MAHENDRA SŪRI. (1320 A.D.)

Yantrarāja or *Yantrarājagama* or *Sadyantra* or *Suyantrāgama.* यन्त्रराज, यन्त्रराजगम, सद्यन्त्र, सुयन्त्रागम c. 1380 A.D.

An astronomical work used for preparing instruments by means of which the times of day and night may be accurately ascertained. The work is in 5 chapters, viz., (i) Gaṇita, (ii) Ghaṭanā, (iii) Yantraracanā, (iv) Yantraśodhana, (v) Vicāraṇa.

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Manuscript reference:

ANUP. iv. p. 379, *9*, 5 ff.
BIK/RM. *760*, 19 ff. Nāgarī.
CENSUS. *4774*, 15 ff. Nāgarī. *1765* A.D.
CP/FK. p. 238, *125*.
GUJARAT. iv. p. 182, *376*, 30 ff.; p. 182, *377*, 58 ff. 1731 A.D.; p. 182, *378*, 37 ff.
IO/JE. v. *2905*, 17 ff. Nāgarī. 1650 A.D.
OUDH. x. p. 10, 32 ff. Nāgarī.
PU. ii. *3831*, 33 ff. Nāgarī. 1847 A.D.; *3832*, 70 ff. Nāgarī.
RORI/JM. ii. *4132*, 19 ff. 1790 A.D.; *5682*, 50 ff. 1882 A.D.
UDAIPUR. p. 116, *518*; p. 116, *1709*, 1671 A.D.
VVRI/VB. *4599*, 8 ff. Nāgarī. 1844 A.D.; *2431*, 19 ff. Nāgarī.

Commentators:

Malayendu Sūri, Mathurānātha.

MAHEŚA ṬHAKKURA. (c. 1556 A.D)

Aticāranirṇaya. अतिचारनिर्णय c. 1556 A.D.

An astronomical work.

Manuscript reference:

BORS/AB. iii. *3*, 6 ff. Maithili; *3A*, 8 ff. Maithili; *3B*, 20 ff. 1881 A.D.

MAHEŚVARA.

Karaṇakutūhala-sāriṇī. करणकुतूहलसारिणी

An astronomical table.

Manuscript reference:

UDAIPUR. p. 18, *550*.

MAHEŚVARĀCĀRYA.

Jyotiṣavṛtta. ज्योतिषवृत्त

An astronomical tract.

Manuscript reference:

CP/HL. p. 174.

MAHEŚVAROPĀDHYĀYA.

Siddhānta-śiromaṇi-bhāṣya. सिद्धान्तशिरोभणिभाष्य

A commentary on the *Siddhāntaśiromaṇi* of Bhāskarācārya.

Manuscript reference:

GUJARAT. iv. p. 208, *525*, 56 ff. 1614 A.D.

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MAHĪDĀSA (c. 1722 A.D.)

Līlāvatīvivaraṇa. लीलावतीविवरण c. 1722 A.D.

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

AS/HS & PS. x. *6913*, 50 ff. Nāgarī. 1795 A.D.
NWP. vii. p. 36, *7*, 30 ff. Nāgarī.

MAHĪDHARA.

Kātyāyana-śulbasūtravivṛti. कात्यायनशुल्बसूत्रविवृतिं

A commentary on the *śulbasūtra* of Kātyāyana.

Manuscript reference:

PU. i. p. 134, *50*, 25 ff.
VVRI/VB. p. 74, *13*, 28 ff. Nāgarī. 1568 A.D.

MAHĪDHARA.

Līlāvatīvivaraṇa. लीलावतीविवरण

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

JSB/SD. p. 27, *667*, 56 ff. Kanarese.
MADRAS/D. *13481*, 148 ff. Telugu.
PU. ii. *3920*, 64 ff. Nāgarī. 1755 A.D.; *3921*, 39 ff. Nāgarī. 1655 A.D.; *3922*, ff. 6-21. Nāgarī.

Makaranda. see MAKARANDA.

MAKARANDA. (1438 A.D.)

Makaranda or *Makarandakārikā* or *Makarandasāraṇī* or *Tithipatra.* मकरन्द, मकरन्दकारिका, मकरन्दसारणी, तिथिपत्र 1478 A.D.

An astronomical work used in the preparation of calendars. It contains mainly tables and is based on the *Sūryasiddhānta.*

Manuscript reference:

ANUP iv. p. 375, *49*, 44 ff.; p. 376, *50*, 22 ff.
AS/HS & PS. x. *6875*, 44 ff. Nāgarī. 19th. century.
BANARAS. p. 264, *75*, ff. 1-21.
BM/CB. *474A*, 10 ff. Jain. 18th. century.
BORS/AB. iii. *244*, A, B. 9 ff. Maithili. 1860 A.D.; *24*, 3 ff. Maithili; *406*, 6 ff. Maithili. 1873 A.D; *137*, 53 ff. Maithili. 1855 A.D.
CSC/HS & SG. ix. p. 91, *89*, 32 ff. Nāgarī. 1848 A.D.
IO/JE. v. *2954*, 27 ff. Nāgarī.

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PU. ii. *3762*, 33 ff. Nāgarī. 1814 A.D.; *3763*, 23 ff. Nāgarī. 1741 A.D.; *3769-3773*, Nāgarī; *3542*, ff. 2-6, Nāgarī; *3765*. 3 ff. Nāgarī.
UJJAIN. p. 51, *8*, 18 ff.

Commentators:

Ḍhuṇḍhirāja, Ḍinakara, Divākara, Gokulanātha, Harikarṇa, Jīvanātha, Kṛpārāma, Kṛṣṇa Śarman, Kṣemaṅkara, Nīlakaṇṭha Jyotirbid, Nīlāmbara, Nṛsiṃhadatta Miśra, Puruṣottama Bhaṭṭa, Rāmadatta, Sadāśiva, Śrīpati Bhaṭṭa, Viśvanātha Ḍaivajña.

Printed text, translations etc.

Makaranda Sāriṇī. Benares, Benarasi Press, 1884 A.D.

Makarandabhāṣya. see PURUṢOTTAMA BHAṬṬA.

Makaranda-bhāvaprakāśa. see NĪLAKAṆṬHA JYOTIRVID s.o. Ananta.

Makaranda-bhāvavivṛti. see NĪLAKAṆṬHA JYOTIRVID.

Makaranda-karaṇa. see APŪCHA JHĀ.

Makarandakārikā. see KṚPĀRĀMA MIŚRA s.o. Lakṣmīnārāyaṇa.

Makarandakārikā. see MAKARANDA.

Makarandapaddhati. see HARAKṚṢṆA.

Makaranda-pañcāṅgopapatti. see ḌHUṆḌHIRĀJA s.o. Nṛsiṃha.

Makaranda-sādhana-prakriyā. see CŪḌĀMAṆI CAKRAVARTĪ.

Makaranda-śāraṇī. see PARAMĀNANDA.

Makaranda-sāraṇī. see MAKARANDA.

Makaranda-sāraṇī. see RĀMADATTA.

Makarandasāraṇyupapatti. see NṚSIṂHADATTA MIŚRA s.o. Haradatta Miśra.

Makaranda-sāriṇī. see SADĀŚIVA.

Makarandasyodāhṛti. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

Makarandaṭīkā. see KṢEMAṄKARA.

Makarandavāsanā. see ḌHUṆḌHIRĀJA s.o. Nṛsiṃha.

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Makarandavāsanā. see GOKULANĀTHA DAIVAJÑA.

Makarandavāsanā. see NĪLĀMBARA JHĀ.

Makaranda-vivaraṇa. see DINAKARA.

Makaranda-vivaraṇa. see DIVĀKARA s.o. Nṛsiṃha.

Makaranda-vivaraṇa. see ŚRĪPATI BHAṬṬA.

Makaranda-vivṛti. see NĪLAKAṆṬHA JYOTIRVID s.o. Ananta.

Makarandodāharaṇa. see ḌHUṆḌHIRĀJA s.o. Nṛsiṃha.

Makarandodāharaṇa. see JĪVANĀTHA JHĀ.

Makarandodāharaṇa. see KṚPĀRĀMA MIŚRA s.o Lakṣmīnārāyaṇa.

Makarandodāharaṇa. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

Makarandopapatti. see GOKULANĀTHA DAIVAJÑA.

MAKKI BHAṬṬA.

Gaṇitabhūṣaṇa-vyākhyā. गणितभूषणव्याख्या

A commentary on the *Siddhānta-śekhara*, an astronomical work of Śrīpati.

Manuscript reference:

MADRAS/T. vol. v. part i. Sanskrit B, 4391, 170 ff. Grantha.

MALAYAGIRI SŪRI.

1. *Jyotiṣakaraṇḍaṭīkā.* ज्योतिषकरण्डटीका

A commentary on the *Jyotiṣakaraṇḍa* of Pūrvādhara, a Jaina manual on astronomy.

Manuscript reference:

AS/KBN. *7559.*

BORI/DC. xvii (1a), *391*, 102 ff. Nāgarī; *392*, ff. 71+127, Nāgarī. 1874 A.D; *393*, 145 ff. Nāgarī. 1583 A.D; *394*, 5 ff. Nāgarī.

GOS/21. p. 28, 233 ff.

GOS/76. *87* (*i*), ff. 169-293. incomplete.

Printed text, translations etc.

Jyotiṣakaraṇḍa with the commentary by Malayagiri Sūri. Published by Ṛṣabhadās Kesarimalji Saṃsthā. Rutlam, 1920.

2. *Kṣetrasamāsaṭīkā.* क्षेत्रसमासटीका

A commentary on the *Kṣetrasamāsa* of Jinabhadra Gaṇi.

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Manuscript reference:
AS/KBN. *2541.*
GOS/21. p. 12, *103*, ff. 4-249.

3. *Sūryaprajñaptivṛtti.* सूर्यप्रज्ञप्तिवृत्ति
A commentary by Malayagiri on the *Sūryaprajñapti*, a Jaina work on astronomy.

Manuscript reference:
AS/AB. *48*, 73 ff. Jaina Devanāgarī.

Printed text, translations etc.
Sūryaprajñapti has been edited with commentary of Malayagiri in Āgamodayasamiti, 1918.

MALAYENDU. (c. 1659 A.D.)

1. *Yantrarāja-racanā.* यन्त्रराजरचना
Useful in the preparation of Yantrarāja.

Manuscript reference:
NWP. i. p. 508, *9*, 25 ff. Nāgarī.

Commentator:
Cintāmaṇi.

2. *Yantrarājaṭīkā.* यन्त्रराजटीका c. 1659 A.D.
A commentary on *Yantrarāja* of Mahendra Sūri. It is a guide to the preparation of an instrument by means of which the times of day and night may be accurately ascertained.

Manuscript reference:
ANUP. iv. p. 380, *12*, 49 ff.; *13*, 33 ff.
AS/KBK. p. 154, Nāgarī
BIK/RM. p. 351, *760*, 42 ff. Nāgarī.
CENSUS. p. 237, *4775*, ff. 1-4, 7-23, Nāgarī; p. 237, *4776*, 28 ff. Nāgarī. 1743 A.D.
GUJARAT. iv. p. 180, *375*, 21 ff. 1617 A.D.
IO/JE. v. *2906*, 60 ff. Nāgarī; *2907*, 23 ff. Nāgarī; *2908*, 40 ff. Nāgarī.
NWP. ii. p. 114, *10*, 34 ff. Nāgarī.
RAS/BB/HV. *255*, 48 ff. Nāgarī.
RORI/JM. ii. *5682*, 50 ff. 1939 A.D; *6254*, 47 ff. 1901 A.D.
VVRI/VB. *2475*, 62 ff. Nāgarī. 1661 A.D; *4726*, 20 ff. Nāgarī. 1844 A.D; *2632*, 5 ff. Nāgarī.

Printed text, translations etc.
Yantrarājaṭīkā. Published by S. Dvivedi and Laṭṭara Śarman. Benares, 1883.

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MALLĀRI s.o. Divākara. (c. 1571 A.D.)

1. *Grahalāghavaṭīkā* or *Siddhāntarahasya.* ग्रहलाघवटीका, सिद्धान्तरहस्य

A commentary on the *Grahalāghava* of Gaṇeśa Daivajña.

Manuscript reference:

ANUP. iv. p. 348, *43*, 143 ff.
AS/HS & PS. x. *6864*.
BANARAS. p. 262, *111*, ff. 1-86. 1762 A.D.
BORS/AB. iii, *56*, 48 ff. Maithili.
GUJARAT. iv. p. 128, *79*, 165 ff.
IO/JE. v. *2931*, 119 ff. Nāgarī. 1520 A.D.
MADRAS/D. xxiv, *13417*, 171 ff.
NOTICES/RM. vi. *2025*, 96 ff. Nāgarī, 1796 A.D.
NU/VK. *535*, 179 ff. Nāgarī.
OUDH (1890). p. 110, *33*, 188 ff. Nāgarī.
PU. ii. *3366*, 142 ff. Nāgarī; *3367*, 83 ff. 1709 A.D.
RTL/MS. p. 158, 82 ff. Kāśmirī.
TANJORE/PPS. xvi, *11368*, 120 ff. Nāgarī.
UJJAIN. p. 51, *130*, 94 ff.
VVRI/VB. *2589*, 14 ff. Nāgarī; *2595*, 11 ff. Nāgarī; *2502*, 30 ff. Nāgarī; *1416*, 17 ff. Nāgari.

Printed text, translations etc.

Grahalāghava. A treatise on astronomy with a commentary by Mallāri. Ed. by L. Wilkinson, Calcutta, 1843.

Grahalāghavaṭīkā or *Siddhāntalāghavaṭikā.* A treatise on astronomy of Gaṇeśa with Mallāri's commentary, Calcutta. 1886.

Grahalāghavakaraṇa. A treatise on practical astronomy with commentary of Mallāri, Viśvanātha and Sudhākara Dvivedi. Ed. by Sudhākara Dvivedi, Benares, 1904.

2. *Grahaṇa.* ग्रहण

It deals with eclipses and allied subjects.

Manuscript reference:

PU. ii. *3344*, 3 ff. Nāgarī. 1537 A.D.
TANJORE/PPS. xvi, *11370*, 4 ff. Nāgarī.
VVRI/VB. *808*, 4 ff. Nāgarī. 1777 A.D.

3. *Grahasāriṇī.* ग्रहसारिणी

An astronomical work dealing with solar and lunar eclipses

Manuscript reference:

AS/HS & PS. x, *6853*, 5 ff. Nāgarī; *6852*, 3 ff.
BORS/AB. iii, *52*, 5 ff. Maithili.

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4. *Sarvârtha-cintāmaṇi.* सर्वार्थचिन्तामणि

An astronomical work.

Manuscript reference:

GUJARAT. iv. p. 204, *506.*

MALLAYA.

Gaṇitaśāstra. गणितशास्त्र

Manuscript reference:

HULTZSCH. i. *551*, 9. ff. Telugu.

MALLAYA YĀYAJŪKA.

Sūryasiddhāntasāra. सूर्यसिद्धान्तसार

A work on astronomy.

Manuscript reference:

MYSORE/AM. p. 51, *318*, 29 ff. Nāgarī.

MALLIKHĀRJUNA.

Sūryasiddhāntavyākhyāna. सूर्यसिद्धान्तव्याख्यान

A commentary on the *Sūryasiddhānta.*

Manuscript reference:

IO/AK. ii. part i. p. 765, *6277*, ff. 119-246. Nāgarī. 1700 A.D.
MAC/HW. p. 162, *1.*
M & C/LR. *340*, Nāgarī.

MALLINĀTHA SŪRI.

Nakṣatrapātādhyāya. नक्षत्रपाताध्याय

An astronomical treatise containing calculations relating to the movement of the planets through the 27 constellations.

Manuscript reference:

MADRAS/T. vol. iii. part i. Sanskrit B, *2387B*, ff. 7a-8b. Telugu. 1917-18 A.D.

MĀMIḌI ŚIṄGAYA, *alias* Nṛsiṃha s.o. Peddanārya, g.s.o. Māmiḍimantrin and great grandson of Citṭaya, and a minister in the court of Peddakanaṭi Vemana.

Gūḍhârtha-dīpikā. गूढार्थदीपिका

A commentary on the *Somasiddhānta.*

Manuscript reference:

MADRAS/T. vol. ii. part i. Sanskrit C, *1715*, 56 ff. Telugu. 1915-16 A.D.

Mānasagrahajñāna-vāsanā. see SŪRYADEVA YAJVAN.

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Mānava-śulbabhāṣya. see ŚIVADĀSA.

Mānava-śulbasūtra. see MANU.

Mānava-śulbasūtrabhāṣya. मानवशुल्वसूत्रभाष्य

A commentary on the *Śulbasūtra* of Manu.

Manuscript reference:

VVRI/VB. p. 75, *13*, 59 ff. Nāgarī. 1755 A.D.

Maṇḍala-vākya. मण्डलवाक्य

Useful for preparing calendars.

Manuscript reference:

MADRAS/T. vol. i. part i. Sanskrit C, *663* (*d*), ff. 25b-26b. Grantha.

MAṆḌALEŚVARA.

Mātṛkāgaṇabhūṣaṇa. मातृकागणभूषण

An astronomical treatise dealing with the method of finding out the exact time by measuring the shadow of a person, classifying the 27 constellations into 3 groups according to certain peculiarities as well as indicating them by certain methods of the alphabets.

Manuscript reference:

MADRAS/D. xxiv. *13468*, 68 ff.

Maṇipradīpa. see RAGHUNĀTHA.

Maṇipradīpodāharaṇa. मणिप्रदीपोदाहरण

A commentary on the astronomical work *Maṇipradīpa* of Raghunātha Bhaṭṭa.

Manuscript reference:

BORS/AB. iii. *254*, 5 ff. Maithili.

MAÑJULĀCĀRYA or Muñjāla. (662 A.D.)

Laghumānasa. लघुमानस

An abridged version of his own Bṛhanmānasa. An astronomical work in 6 chapters, viz., (i) Sūryagrahādhikāra, (ii) Madhyagrahādhikāra, (iii) Candragrahādhikāra, (iv) Chāyālagnādhikāra, (v) Grahayuddha-grahādhikāra, (vi) Grahodayāstamayādhikāra.

Manuscript reference:

MADRAS/D. xxiv. *13475*, 63 ff. Telugu.
MADRAS/T. iii. part i. Sanskrit B, *2472*(f), ff. 94b-98b.

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Nāgarī & Telugu. 1917-18 A.D.; iii, part i. Sanskrit C, *3870* (*d*), ff. 150b-154a.
MYSORE/AM. p. 50, *28*, 3 ff. Nāgarī; *316*, 5 ff, Kanarese.
TRI/KS. iv. *947A*, 4 ff. Malayalam; *948*, 18 ff. Malayalam; *949*, 52 ff. Malayalam.

Commentators:
Parameśvara, Prakāśāditya, Sūryadeva Yajvan, Yallaya.

Printed text, translations etc.
Laghumānasa. A work on astronomy. Ed. by Balavanta Dattātreya Āpte. Ānandāśram Sanskrit Series No. 123, Poona, 1944.

Study:
COLEBROOKE, H. T. 'Note to an Essay on the Notations of the Hindu Astronomers, concerning the precession of the Equinoxes.' *AR*. xii, 1816; reproduced in *Misc. Essays*, ii, 374-416.
SENGUPTA, P. C. 'Hindu Luni-solar Astronomy', *BCMS*, **24**, 1-18, 1932.

Manoramā. see GAÑGĀDHARA s.o. Nārāyaṇa.

Manoramā. see KAMALĀKARA s.o. Nṛsiṃha.

Manorañjanā. see RĀMAKṚṢṆA DEVA s.o. Sadāśiva Āpadeva.

MANU.

Mānava-śulbasūtra. मानवशुल्वसूत्र

It is a part of the *Mānava-śrautasūtra* (see under printed text, translations etc.) in both prose and verse. It describes, among others, measuring tape, gnomon, the technique of ascertaining cardinal points etc. It also describes a primitive *citi* known as *Suparṇaciti*, of which no such description is met with either in Baudhāyana or in Āpastamba *Śulbasūtra*. No other *citi* is mentioned and the major portion of the work is devoted to the construction of different *vedis* and the relevant geometrical rules necessary for the purpose.

Manuscript reference:
VVRI/VB. p. 75, *13*, 4 ff. Nāgarī.

Commentator:
Śivadāsa.

Anonymous commentary:
Mānavaśulbasūtrabhāṣya.

Printed text, translations etc.
Mānavaśulbasūtra. Translated into English by N. K. Mazumdar, *JDL/CU*, **8**, 327-42, 1922.

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The Mānava Śrautasūtra belonging to the *Maitrāyaṇa Saṃhitā*. Ed. by Dr. Jeannette M. Van Gelder, New Delhi, 1961. (Śatapiṭaka series No. 17).

Study:

MAZUMDĀR, N. K. 'On the different Śulbasūtras', *PTOC/II*, 561-64, Calcutta, 1922.

Marīci. see MUNĪŚVARA.

MATHURĀNĀTHA ŚUKLA. (1758 A.D.).

1. *Jyotiṣasiddhāntasāra*. ज्योतिषसिद्धान्तसार c 1778 A.D.

A practical astronomy in 8 chs.

Manuscript reference:

BANARAS. p. 261, *166*, ff. 1-61.
RORI/JM. ii, *5631*.
TCC/TA. p. 58. 28 ff. Bengali. 1804 A.D.

2. *Yantrarājaṭīkā* or *Yantrarājapaddhati*. यन्त्रराजटीका, यन्त्रराजपद्धति

A commentary on the *Yantrarāja*.

Manuscript reference:

BANARAS. p. 268, *117*, ff. 1-31. 1820 A.D.; p. 560, *153*, 45 ff. Nāgarī.
NWP. v. p. 2, 3, 36 ff. Nāgarī.

MATHURĀNĀTHA VIDYĀLAṄKĀRA. (c. 1609 A.D.)

Ravisiddhāntamañjarī or *Sūryasiddhāntamañjarī* or *Siddhāntamañjarī*. रविसिद्धान्तमञ्जरी, सूर्यसिद्धान्तमञ्जरी, सिद्धान्तमञ्जरी

An elementary treatise on astronomy.

Manuscript reference:

AS/HS & PS. x, *6945*, 12 ff. Bengali. 19 th century; 6946, 11 ff Bengali.
AS/KBK. p. 224. Bengali.
BANARAS. p. 257, *92*, 17 ff.
BN/AC. i, *866*, Bengali. 19th century; *997*, Bengali. 1788 A.D.
IO/JE. v, *2904*, 25 ff. Bengali.
PU. ii. *4083*, 15 ff. Nāgarī.
TCC/TA. p. 47. 20 ff. Bengali. 1780 A.D.

Printed text, translations etc.

Ravi-siddhānta-mañjarī. Ed. by Biśvambhara Jyotiṣārṇava. *Bibliotheca Indica* No. 198. Calcutta. 1911 A.D.

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MATHUREŚA.

Jyotiḥsāgarasāra. ज्योतिःसागरसार
A work on astronomy.

Manuscript reference:
VSP. p. 260, *453*; *381*; 1583; 1635.

Mātṛkāgaṇabhūṣaṇa. see MAṆḌALEŚVARA.

MAYADĀNAVA.

Grahalāghavabhāṣya. ग्रहलाघवभाष्य
A commentary on the *Grahalāghava* of Gaṇeśa Daivajña.

Manuscript reference:
GUJARAT. iv. p. 128, *81*.

Mitabhāṣiṇī. see RAṄGANĀTHA s.o. Nṛsiṃha Daivajña.

Miṭākṣarā. see BHĀSKARĀCĀRYA.

Mitaṅka. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

Mithyājīvāsāraṇī. मिथ्याजीवासारणी
An anonymous logarithmic sine and tan table.

Manuscript reference:
CSC/HS & SG. ix, *93*, 45 ff. Nāgarī. 1893 A.D.

MOHANADĀSA.

Siddhāntaśiromaṇivāsanā. सिद्धान्तशिरोमणिवासना
A commentary on the *Siddhāntaśiromaṇi* of Bhāskarācārya.

Manuscript reference:
GUJARAT. iv. p. 208, *522*, 114 ff. 1896 A.D.

MOṢADEVA s.o. Bhīmadeva, (c. 1473 A.D.)

Līlāvatīṭīkā. लीलावतीटीका
A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:
BU/GD. i, *385*, 150 ff. Nāgarī.
RAS/BB/HV. *273*, 109 ff. Nāgarī. 1745 A.D.
RTL/MS. p. 172. 12 ff.

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MUNĪŚVARA *alias* VIŚVARŪPA s.o. Raṅganātha. (1603 A.D.)

1. *Marīci.* मरीचि

A commentary on the *Siddhāntaśiromaṇi* of Bhāskarācārya.

Manuscript reference:

AS/KBK. p. 225. Bengali.
BANARAS. p. 259, *99*, ff. 1-175; p. 256, *174*, 179 ff. 1782 A.D.
BORS/AB. iii, *412*, 19 ff. Maithili; *413*, 32 ff. Maithili; *35*, 17 ff. Nāgarī. 1858 A.D.; *152*, 196 ff. Nāgarī; *324*, 25 ff. Maithili.
CSC/HS & SG. ix, *83*, 25 ff. Nāgarī; *170*, 492 ff. Nāgarī; *171*, 399 ff. 1815 A.D.
IO/JE. v. *2862*, 127 ff. Nāgarī. 1792 A.D.; *2863*, 96 ff. Nāgarī; *2864*, 226 ff. Nāgarī; *2865*, ff. 44+75. Nāgarī; *2866*, 110 ff. Nāgarī; *2867*, 156 ff. Nāgarī; *2868*; *2869*, 106 ff. Nāgarī; *2870*, 208 ff. Nāgarī; *2871*, 38 ff. Nāgarī; *2872*, 74 ff. Nāgarī; *2873*, 78 ff. Nāgarī; *2874*, 145 ff. Nāgarī; *2875*, ff. 114-158; Nāgarī. 1792 A.D.; *2876*, 275 ff. Bengali; *2877*, 281 ff. Nāgarī.
NWP. i. p. 578, *198*, 32 ff. Nāgarī; ii. p. 116. *18*, 800 ff. Nāgarī; viii. p. 54. *8*, 448 ff. Nāgarī.
PU. ii. *3475*, 15 ff. Nāgarī; *4058*, 332 ff. Nāgarī; *3910-12*. Nāgarī.
VVRI/VB. *3959*, 57 ff. Nāgarī.

Printed text, translations etc.

Marīci. By Munīśvara Gaṇaka *alias* Viśvarūpa. Ed. by Viṣṇu Dattātreya Āpte. Poona. Ānandāśrama Press. 1943 (Ānandāśrama Sanskrit Series No. 122).

2. *Pāṭīsāra.* पाटीसार

A work on Mathematics.

Manuscript reference:

BANARAS. p. 256, *91*, ff. 5-6, 11-26. 1667 A.D.
BORS/AB. iii, *165*, 10 ff. Maithili.

3. *Siddhāntasārvabhauma.* सिद्धान्तसार्वभौम c 1627 A.D.

An astronomical work containing both text and author's own commentary. It is divided into two principal sections, *viz*, (i) Pūrvārdha, (ii) Uttarārdha. The *Pūrvārdha* Section has 6 chs. *viz*, (i) Madhyagrahānayana, (ii) Spaṣṭagrahānayana, (iii) Tripraśna, (iv) Grahacchāyā, (v) Śṛṅgonnatyadhikāra, and (vi) Grahayogādhikāra. The *Uttarārdha* Section has the following 2 chs. (i) Yantra, and (ii) Praśna.

Manuscript reference:

ANUP. v. p. 401, *29*, 199 ff.
BANARAS. p. 259, *74*, ff. 1-69, 1-41. 1876 A.D.; p. 259, *97*, ff. 1-10, 10-82, 82-325. 1731 A.D.
BM/CB. *464*, 74 ff. Nāgarī.

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BORS/AB. iii. *407*, 18 ff. Maithili; iii. *415*, 23 ff. 1836 A.D.
CSC/HS & SG. ix, *179*, 34 ff. Nāgarī. 1803 A.D.
GUJARAT. iv, p. 206, *517*, 57 ff.
IO/JE. v. *2886-2888*, 408 ff. Nāgarī. 1792 A.D.; *2889*, 80 ff. Nāgarī.
NOTICES/RM. v, *1858*, 48 ff. Maithili.
NWP. v. p. 202, *1*, 110 ff. Nāgarī.
RAS/BB/HV. *288*, 503 ff. Nāgarī. 1798 A.D.
RTL/MS. p. 176, 612 ff.

Printed text; translations etc.

Siddhāntasārvabhauma. A treatise on astronomy. Ed. with introduction by Muralidhara Ṭhakkura. The Prince of Wales Sarasvatī Bhavana text. No. 41. Benares. 1932.

MUÑJĀDITYA.

Bālabodha. बालबोध

An astronomical work.

Manuscript reference:

AS/KBK. p. 117. Nāgarī.

Muñjāla. see MAÑJULĀCĀRYA.

MURĀRI s.o. Nārāyaṇa.

Tithidarpaṇa. तिथिदर्पण

An astronomical table.

Manuscript reference:

BM/CB. *474C*, 8 ff. Jaina. 18th century.

NĀGEŚA DAIVAJÑA s.o. Śiva Daivajña and grandson of Tukeśvara. (c. 1619 A.D.)

1. *Grahaprabodha.* ग्रहप्रबोध 1619 A.D.

A short astronomical text in 37 stanzas.

Manuscript reference:

BU/GD. i, *343*, 5 ff. Nāgarī.
PU. ii, *3350*, 5 ff. Nāgarī.
RAS/BB/HV. *232*, 32 ff. Nāgarī. 1813 A.D.

Commentator:

Yādava.

Anonymous commentary:

Grahaprabodha-udāharaṇa

2. *Grahaprabodhaṭīkā.* ग्रहप्रबोधटीका

A commentary on the above work.

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Manuscript reference:
CP/HL. p. 144, *1539.*

Nakṣatrābhidhāna. नक्षत्राभिधान
An anonymous work.
Manuscript reference:
NOTICES/RM. iii, *1123*, 2 ff. Bengali.

Nakṣatra-cakra. नक्षत्रचक्र
An anonymous work.
Manuscript reference:
ANUP. iv. p. 365, *377*, 1 ff.

Nakṣatra-cūdāmaṇi. see YAVANĀCĀRYA.

Nakṣatra-cūḍāmaṇi. नक्षत्रचूडामणि
An anonymous work.
Manuscript reference:
CP/FK. p. 230, *65*, 6 ff.
HULTZSCH. i, *637b*, 14 ff. Telugu.
TANJORE/PPS. xvi, *11460*, 16 ff. Telugu.

Nakṣatra-dīpikā. नक्षत्रदीपिका
An anonymous work.
Manuscript reference:
PU. ii, *3573*, 5 ff. Tamil.

Nakṣatramālā. see BHĀRGAVA.

Nakṣatranāma. see JARE.

Nakṣatranāmamālā. see HEDIRA DATTA.

Nakṣatra-nighaṇṭu. नक्षत्रनिघण्टु
An anonymous work.
Manuscript reference:
IO/AK. ii. part i, *6313*, 2 ff. Telugu. 18th century.
MADRAS/D. xxiv. *13797-13809.*
MADRAS/T. Vol. iv. part i. Sanskrit c, *3943(f)*, 58 ff. Grantha.
PU. ii, *3574*, 2 ff. Telugu.
TANJORE/PPS. xvi, *11461*, 7 ff. Telugu.

Nakṣatrapaṅkti. see GAṆEŚA DAIVAJÑA.

Nakṣatrapātādhyāya. see MALLINĀTHA SŪRI.

Nakṣatra-patrikā kāśmīrī. see NĀRĀYAṆA BHAṬṬA.

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Nakṣatra-sārāvalī. नक्षत्रसारावली

An anonymous work.

Manuscript reference:

NEPAL/HS. i. p. 194, *1188*, 14 ff. Newari.

Nakṣatra-vivaraṇa. see KODAṆḌARĀMA s.o. Veṅkaṭakṛṣṇa.

NĀMANĀRYA s.o. Śrīmūlasena (?)

Gaṇitārṇava. गणितार्णव

An astronomical work following the *Sūryasiddhānta* in 8 chs, *viz.*, (i) Tithyadhyāya, (ii) Madhyagrahādhikāra, (iii) Sphuṭagrahādhikāra, (iv) Udayāstamayādhikāra, (v) Upakaraṇādhyāya, (vi) Mahāpātādhikāra, (vii) Grahaṇādhikāra and (viii) Sūryagrahaṇādhikāra.

Manuscript reference:

MADRAS/T. Vol. iii. part i. Sanskrit B, *2602e*, ff. 58a-73b. Telugu; xi, *7524*, ff. 114a-127a.

NANDANA s.o. Amara Siṃha.

Jyautiṣa-makaranda. ज्यौतिषमकरन्द

Manuscript reference:

RORI/JM. ii, *4896*, 6 ff. 18th century.

NANDARĀMA. (c. 1804 A.D.)

Yantrasāra. यन्त्रसार

Manuscript reference:

CENSUS. *4723*, 27 ff. Nāgarī. 1834 A.D.

NANDARĀMA MIŚRA of Kāmyakavana. (c. 1763 A.D.)

Grahaṇapaddhatī. ग्रहणपद्धति 1763 A.D.

A Karaṇa work dealing with different calculations on eclipses.

Manuscript reference:

NWP. x. p. 48, *6*, 6 ff. Nāgarī.

RORI/JM. ii, *4104*, 5 ff. 1832 A.D.; *4761*, 6 ff. 19th century.

NANDĪKEŚVARA s.o. Vedāṅgarāya of the court of Shah Jahan.

Gaṇakamaṇḍana. गणकमण्डन

Manuscript reference:

NEPAL/HS. p. 163, *1412*, 8 ff. Nāgarī.

PU. ii. *3322*, 28 ff. Nāgarī. 1771 A.D.

RORI. ii, *5171*, 52 ff. 1794 A.D.

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NANDĪSŪRI.

Kheṭa-tantra. खेटतन्त्र

An astronomical work in 8 chs viz., (i) ..... (ii) Grahaṃadhyādhikāra, (iii) Sphuṭādhikāra, (vi) ..... (v) Vaidhṛtyādinirūpaṇa, (vi) Candragrahaṇādhikāra, (vii) Sūryagrahaṇādhikāra and (viii) .....

Manuscript reference:

MADRAS/D. xxiv, *13405*, 42 ff. Telugu.

NARACANDRA.

Jyotiṣa. ज्योतिष

An astronomical work.

Manuscript reference:

BN/AC. i, *968* (*viii*), Nāgarī. 18th century.

NĀRACANDRA.

Bhūvanadīpaka. भूवनदीपक

Manuscript reference:

GUJARAT. iv. p. 170, *811*, 23 ff.

NARAHARI.

Ahibalacakra. अहिबलचक्र

Manuscript reference:

GUJARAT. iv. p. 114, *9*, 6 ff.

NARAHARI SŪRI s.o. Nṛsiṃha Sūri.

Gaṇakavallabha. गणकवल्लभ

An astronomical work in 2 chs. *viz.*, (i) Madhyagrahādhikāra and (ii) Spuṭādhikāra.

Manuscript reference:

MADRAS/T. Vol. iii. part i. Śanskrit B, *2428d*, ff. 12b-15b. Telugu. 1917-18 A.D.

NARASIṂHA s.o. Naupūri Śiṅgayārya. (c 1687-1747 A.D.)

Tithicakra. तिथिचक्र c 1687-1747 A.D.

An astronomical treatise giving the calculations for determining the various *tithis*, the *avamāsa* etc., useful in the preparation of a calendar. This work, according to the author, is based on the *Tithicakra* of Mallikārjuna Sūri.

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Manuscript reference:
MADRAS/T. Vol. iii. part i. Sanskrit B, *2454b*, ff. 12a-16a. Telugu. 1917-18 A.D.

NARASIṂHA or Nṛsiṃha. (17th century.)

Kālaprakāśikā. कालप्रकाशिका

Manuscript reference:
HULTZSCH. ii, *1140*, 64 ff. Grantha. incomplete.
TANJORE/PPS. xvi, *11338*, 78 ff. Grantha; *11339*, Telugu; *11340*, Grantha. incomplete; *11341*, Grantha. incomplete; *11342*, Grantha. incomplete; *11343*, Grantha. incomplete; *11344*, Grantha. incomplete; *11345*, Grantha. incomplete; *11346*, Grantha. incomplete; *11347*, Grantha. incomplete.

Printed text, translations etc.
Kālaprakāśikā. Ed. T. Rāmavāmi Śāstrin. Madras.

NĀRĀYAṆA.

Karmapradīpakā or *Karmadīpaka.* कर्मप्रदीपक, कर्मदीपक
A commentary on the *Līlāvatī* of Bhāskarācārya.
Manuscript reference:
MADRAS/D. xxiv, *13484*, 120 ff. Nāgarī.
PU. ii, *3917*, 103 ff. Malayalam; 3918. 20 ff. Tamil. incomplete.
TRI/TG. i, *128*, Malayalam.

NĀRĀYAṆA.

Nārāyaṇībīja. नारायाणीबीज
A treatise on algebra.
Manuscript reference:
BANARAS. p. 257, *94*, 13 ff. incomplete.

NĀRĀYAṆA.

Uparāga-kriyā-krama. उपरागक्रियाक्रम
An astronomical treatise, describing the methods of determining the time of occurrence of the eclipses etc. in 5 chs. viz., (i) Paryantaviṣaya, (ii) Somagrahaṇādhyāya, (iii) Sūryagrahaṇādhyāya, (iv) Ādāyaviṣaya and (v) Vyatīta-pātā-grahamauḍhāvabodha.

Manuscript reference:
MADRAS/D. xxiv, *13396*, 16 ff. Telugu.

NĀRĀYAṆA s.o. Rāma. (c. 1559 A.D.)

Grahaṇalikhanānukrama. ग्रहणलिखनानुक्रम 1559 A.D.

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Manuscript reference:
RAS/BB/HV. *231*, 13 ff. Nāgarī.

NĀRĀYAṆA BHAṬṬA.

Nakṣatra-patrikā-kāśmīrī. नक्षत्रपत्रिकाकाश्मीरी
A calendar.

Manuscript reference:
JRAS/1912. *307*, 14 ff. Śāradā.

Nārāyaṇībīja. see NĀRĀYAṆA.

NĀRĀYAṆA DAIVAJÑA s.o. Govinda Daivajña.

Grahalāghava-siddhāntarahasyodāhṛti.
ग्रहलाघवसिद्धान्तरहस्योदाहृति
A commentary on the *Grahalāghava* of Gaṇeśa Daivajña.

Manuscript reference:
AS/HS & PS. x, *6859*, 44 ff. Nāgarī. 1636 A.D.

NĀRĀYAṆA PAṆḌITA s.o. Nṛsiṃha Daivajña. (c. 1356 A.D.)

1. *Gaṇitakaumudī.* गणितकौमूदी
A mathematical treatise in 14 chs.

Manuscript reference:
CSC/HS & SG. ix, *71*.
GUJARAT. iv. p. 122, *47*, 32 ff.
IO/JE. v, *2883*, 37 ff. Nāgarī. 1791 A.D.
RORI/JM. ii, one copy. 37 ff. 19th century.
TCC/TA. p. 77. 41 ff. Bengali.

Printed text, translations etc.
Gaṇitakaumudī. Ed. by Padmakara Dvivedin, 2 parts. The Prince of Wales Saraşvatībhavana text no. 57. Benares. 1936 & 1942.

2. *Bījagaṇitāvataṃsa.* बीजगणितावतंस
A work on algebra, (For details, see Datta. 'Algebra of Nārāyaṇa', *ISIS*, **19,** 472-85, 1933).

Study:
DATTA, B. 'Nārāyaṇa's method for finding approximate rule of a surd', *BCMS*, **23,** 186-194, 1931.
DATTA, B. 'The Algebra of Nārāyaṇa,' *ISIS*, **19,** 472-485, 1933.
GARVER, RAYMOND. 'Concerning two square-root methods', *BCMS*, **24,** 99-102, 1932.

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SARASVĀTI, T. A. 'The development of mathematical series in India after Bhāskara II', *BNISI*, **21**, 320-43, 1963.

NĀRĀYAṆA ŚARMĀ.

1. *Kālacakravivaraṇa.* कालचक्रविवरण

A short work in 90 verses on the preparation of an instrument to indicate the time.

Manuscript reference:

IO/AK. ii. part i, *6310*, 9 ff. Nāgrrī. 1800 A.D.

2. *Kālacakravivaraṇaṭīkā.* कालचक्रविवरणटीका

A commentary on the above work.

Manuscript reference:

IO/AK. ii. part I, *6311*, ff. 10-31. Nāgarī. 1800 A.D.

Narmadaṭīkā. see PADMANĀBHA s.o. Narmada.

NARMADĪYAKṚṢṆA.

Dhruvabhramaṇa. ध्रुवभ्रमण

Manuscript reference:

PU. ii, *3570*, 9 ff. Nāgarī. Incomplete.

Navagrahacakra. नवग्रहचक्र

An anonymous astronomical work.

Manuscript reference:

TANJORE/PPS. xvi, *11473*, 17 ff. Nāgarī.; *11474*, 7 ff. Nāgarī.

Navagrahacintāmaṇi. नवग्रहचिन्तामणि

An anonymous work.

Manuscript reference:

ANUP. iv. p. 366, *402*, 6 ff. 1695 A.D.; p. 367, *403*, 4 ff.

Navagrahanāmādicakra. नवग्रहनामादिचक्र

An anonymous work.

Manuscript reference:

ANUP. p. 367, *404*, 1 ff.

Navagrahapadaka. नवग्रहपदक

An anonymous work.

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Manuscript reference:
MADRAS/D. xxiv, *13396*. Telugu.
TANJORE/PPS. xvi, *11705*, 12 ff. Nāgarī.

Navāṅkura. see KṚṢṆA DAIVAJÑA s.o. Ballāla.

Navarekhācakra. नवरेखाचक्र

An anonymous work.

Manuscript reference:
ANUP. iv. p. 367, *407*, 1 ff.

NAYANASUKHOPĀDHYĀYA. (c. 1730 A.D.)

Ukārākhya-granṭha. उकाराख्यग्रन्थ 1730 A.D.

The work appears from the figures given in illustrations to be a treatise on spherical geometry. Originally a Greek work, the book was later translated into Arabic by several people. *Kustavivilukā Balbhuī* [Qusta b. Lūqā (?)] translated up to the fifth figure of the third chapter, at the request of Abul Abbas Ahmed, and the remaining portion was translated by others, whose names are not given. Sāvita Viṃkusais [Sâbit b. Qurra (?)] corrected the work and Nāsīr made a commentary on it. Taking the help of one Abid, Nayanasukha translated it from the Arabic version into Sanskrit in 1730 A.D.

Manuscript reference:
CSC/HS & SG. ix, *118*, 54 ff. Nāgarī.
TCC/TA. p. 76, 66 ff. Nāgarī. 1803 A.D.

NIDHIMIŚRA DAIVAJÑA.

Grahādarśapatra. ग्रहादर्शपत्र

Manuscript reference:
NOTICES/HS. iv, *81*, 7 ff. Nāgarī.

NĪLAKAṆṬHA.

Bhūgolavicāra. भूगोलविचार

Manuscript reference:
RAS/BB/VM. p. li, *7*.

NĪLAKAṆṬHA.

Grahalāghava-sāraṇī. ग्रहलाघवसारणी

Astronomical tables based on the *Grahalāghava* of Gaṇeśa.

Manuscript reference:
UDAIPUR. p. 42, *542*.

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NĪLAKAṆṬHA s.o. Govinda Sūri. (End of 17th century.)

Saurapaurāṇika-mata-samarthana. सौरपौराणिकमतसमर्थन

In this work, an attempt is made to reconcile the cosmological views of the purāṇas, regarding our globe, with those of the *Sūryasiddhānta.*

Manuscript reference:
IO/JE. v, *2885*, 18 ff. Nāgarī.
RAS/BB/HV. *298*, 7 ff. Nāgarī.

NĪLAKAṆṬHA JYOTIRVID s.o. Ananta, the chief Paṇḍit of the court of Akbar. (c. 1587 A.D.)

1. *Grahakautuka.* ग्रहकौतुक

Manuscript reference:
CP/FK. p. 226, *22*, 17 ff. 1817 A.D.

2. *Grahalāghava.* ग्रहलाघव (?)

Manuscript reference:
GUJARAT. iv. p. 126, *76*, 83 ff.

3. *Makaraṇda-vivṛti* or *Makarandabhāva-vivṛti* or *Makarandabhāva-prakāśa.* मकरन्दविवृति, मकरन्दभावविवृति, मकरन्दभावप्रकाश

An exposition of the *Tithipatra* of Makaranda.

Manuscript reference:
ANUP. iv. p. 376, *551*, 11 ff. *552*, 3 ff.
RORI/JM. ii, *7519*, 5 ff.

4. *Sāraṇī-koṣṭhaka.* सारणीकोष्ठक

Manuscript reference:
GUJARAT. iv. p. 206, *508*, 95 ff. 1848 A.D.

5. *Subodhinīṭīkā.* सुबोधिनीटीका

A commentary on the *Jaiminīyasūtra*, the astronomical aphorisms of Jaimini.

Manuscript reference:
GUJARAT. iv. p. 136, *127*, 54 ff. 1876 A.D.
UJJAIN. p. 55, *2297*, 46 ff.

6. *Tithiratnamālā.* तिथिरत्नमाला

Manuscript reference:
GUJARAT. iv. p. 146, *187*, 20 ff.

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NĪLAKAṆṬHA SOMASUṬVAN. (1465-1545 A.D.)

1. *Āryabhaṭīyabhāṣya.* आर्यभटीयभाष्य

A commentary on the *Āryabhaṭīya* of Āryabhaṭa I.

Manuscript reference:

TRI/TG. iv. *76*, Malayalam; vii. *65*, Malayalam.

Printed text, translations etc.

Āryabhaṭīya with *Bhāṣya* of Nīlakaṇṭha Somasutvan. Parts I & II. *Gaṇitapāda, Kālakriyāpāda.* Edited by K. Sambasiva Sastri. Trivendrum Sanskrit series nos. 101 & 110. 1931-32. Part III. *Golapāda.* Edited by Suranad Kunjan Pillai. Trivendrum Sanskrit series no. 185. 1957.

2. *Candracchāyāgaṇita* or *Chāyāgaṇita.* चन्द्रच्छायागणित, छायागणित

It deals with the methods for calculation of time during night from a measurement of the shadow cast by the moon.

Manuscript reference:

K. V. Sarma informs us that (cf. *JORM*, **46,** parts I-IV, p. 24, 1958) two Mss. have been traced, one at the Adyar library, Madras (Ms. no. *R. 5185(b)*) and the other in Travancore University (Ms. no. *5862 B*).

3. *Candracchāyāgaṇitaṭīkā.* चन्द्रच्छायागणितटीका

It explains the principles and methods used in the text.

Manuscript reference:

Adyar library Ms. no. *R. 5185(b)*, and Travancore Univ. Ms. no. *5862B* (cf. *JORM*, **46,** parts I-IV, p. 24, 1958).

4. *Golasāra.* गोलसार

A small metrical treatise on astronomy specially dealing with the earth and the planets in 3 chs.

Manuscript reference:

IO/AK. ii. part i, *6301*, 24 ff. Malayalam. 19th century.

MADRAS/T. vol. vi. part i. Sanskrit, *5151a*, ff. 1a-3b. Grantha. 1925-26 A.D.

Adyar Library Ms. no. *R. 5151.* Two Mss. in the Travancore Univ. Mss. no: *T 846, 5867B* (cf. *JORM*, **46,** parts I-IV, p. 24, 1958).

5. *Siddhānta-darpaṇa.* सिद्धान्तदर्पण

A short work on astronomy in 32 stanzas.

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Manuscript reference:

IO/AK. ii. part, i, *6302*, 3 ff. Malayalam. 19th century.

MADRAS/T. vol. vi. part i. Sanskrit. *5151b*. ff. 3b-5a. Grantha. 1925-26 A.D.

Two mss. are deposited in Travancore Univ. Mss. nos. *5867c*, *475D*.

Printed text, translations etc.

Siddhānta-darpaṇa. Ed. with English translation by K. V. Sarma, Madras, 1955.

6. *Tantra-saṃgraha*. तन्त्रसंग्रह

A work on astronomy, containing about 430 stanzas in 8 chs. The conception of time, computation of past *Kali* days, the seasons, solar and lunar months are described in the first chapter. Calculation of the mean solar day, determination of the orbit of the planets in the Hindu geocentric system are described in the second chapter. The third chapter deals with the fixing of the gnomon, calculation of the equator, meridian, latitude, declination etc. by making use of the gnomon and its shadow. There are many illustrations and mathematical problems concerning the gnomon and its shadow. The fourth and the fifth chapters deal with the lunar and solar eclipses. *Vyatīpāta* and its calculations are dealt with in the sixth and seventh chapters. The last chapter describes the *Sitamāna-Śṛṅgonnati* etc. of the moon.

Manuscript reference:

MADRAS/D. xxiv, *13426*, 45 ff. Nāgarī.

MADRAS/T. vol. iv. part i. Sanskrit B, *3205*, 94 ff. Nāgarī. 1920-1921 A.D.; vol. iv. part i. Sanskrit C, *3877i*, ff. 89a-101b. Grantha. incomplete; vol. x. Sanskrit A. *6122a*, ff. 77a-82b. Grantha.

PU. ii. *3493*, 25 ff. Malayalam.

TRI/KS. iii, *887*, 10 ff. Malayalam.

TRI/TG. vii, *73*, Malayalam.

Anonymous commentary:

Tantra-saṃgraha-kriyākalpa-vyākhyā, *Tantra-saṃgraha-laghuvyākhyā*, *Tantra-saṃgraha-vivṛti* and *Tantra-saṃgraha-vyākhyā*.

Printed text, translations etc.

The Tantra-saṃgraha, with commentary *Laghu-vivṛti* by Śaṅkara Vāriar. Published by Suranad Kunjan Pillai. Trivendrum Sanskrit Series No. 188. Trivendrum. 1958.

Study:

BALAGANGADHARAN, K. 'Appendix; on the Hindu Quadrature of the circle,' *JBBRAS*, ns. **20**, 77-82, 1944.

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MARAR, K. AND RAJAGOPAL, C. T. 'On the Hindu quadrature of the circle', *JBBRAS*, **20,** 65-77, 1944.

RAJAGOPAL, C. T. 'A neglected chapter of Hindu Mathematics', *SM*, **15,** nos 3-4, 201-209, 1949.

RAJAGOPAL, C. T. AND AIYAR, T. V. VEDAMURTHI. 'On the Hindu proof of Gregory's series', *SM* **17,** nos. 1-2, 65-74, 1951.

RAJAGOPAL, C. T. and VENKATARAMAN, A. 'The Sine and Cosine Power series in Hindu Mathematics (with an addendum by K. M. George)'. *JASB*, 3rd series, **15,** 1-13, 1949.

SARASVATI, T. A. 'The development of mathematical series in India after Bhāskara II', *BNISI*, No. 21, 320-43, 1963.

WHISH, C. M. 'On the Hindu quadrature of the circle and the infinite series of the proportion of the circumference to the diameter exhibited in the four śāstras, the *Trantrasaṃgraha*, *Yuktibhāṣā*, *Karaṇapaddhati* and *Sadratnamālā*.' *TASGBI*, **3,** 509-23, 1835.

NĪLĀMBARA JHĀ. (1825 A.D.)

1. *Golaprakāśa.* गोलप्रकाश

The author has incorporated three types of knowledge in this work, *viz.* (i) For several demonstrations, he has taken help of English books, (ii) applied his own knowledge on the subject which is different from the ancient, and (iii) ancient Siddhānta theories. The work consists of 5 chapters *viz.*, (i) Jyotpattiganita (or canon of science), (ii) Trikoṇamitiganita (plane trigonometry), (iii) Golarekhāganita (spherical geometry), (iv) Cāpīya trikoṇamitiganita (spherical trigonometry), (v) Trikoṇamitipraśna (questions on plane and spherical trigonometry).

Manuscript reference:

AS/KBK. p. 58, Nāgarī.

Printed text, translations etc.

Golaprakāśa. A work on spherics by Paṇḍit Nīlāmbara Jhā. Corrected and edited by Paṇḍit Bāpūdeva Śāstrī, Benares, 1872.

2. *Dṛkkarma-vyākhyā.* दृक्कर्मव्याख्या

A commentary on the *Dṛkkarma* portion of the *Siddhānta-Śiromaṇi* of Bhāskarācārya.

Manuscript reference:

BORS/AB. iii. *142*, 24 ff. Maithili. 1872 A.D.

3. *Jyotpatti-vyākhyā.* ज्योत्पत्तिव्याख्या

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A commentary on the *Jyotpatti* portion of the *Siddhānta-Śiromaṇi* of Bhāskarācārya.

Manuscript reference:

BORS/AB. iii, *124*, 21 ff. Maithili.

4. *Kṣetraparibhāṣā.* क्षेत्रपरिभाषा

An elementary treatise on western geometry.

Manuscript reference:

BORS/AB. iii, *37*, 2 ff. Maithili.

5. *Līlāvatyudāharāṇa* or *Līlāvatyupapatti.* लीलावत्युदाहरण, लीलावत्युपपत्ति

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

BORS/AB. iii, *327*, 13 ff. Maithili. incomplete; *327A*, 20 ff. Maithili. incomplete.

6. *Makaranda-vāsanā.* मकरन्दवासना

A commentary on the *Tithipatra* of Makaranda.

Manuscript reference:

BORS/AB. iii, *248*, 5 ff. Maithili.

7. *Pañcāṅga-vāsanā.* पञ्चाङ्गवासना

Manuscript reference:

BORS/AB. iii, *162*, 6 ff. Maithili.

8. *Tattvaviveka-vyākhyā.* तत्त्वविवेकव्याख्या

A commentary on the *Praśnādhyāya* of *Siddhānta-tattvaviveka* of Kamalākara.

Manuscript reference:

BORS/AB. iii, *125*, 25 ff. Maithili; *202.*

9. *Valana-vyākhyā.* वलनव्याख्या

A commentary on the *Valana* portion of the *Siddhāntaśiromaṇi* of Bhāskarācārya.

Manuscript reference:

BORS/AB. iii, *207*, 10 ff. Maithili; *207c*, 57 ff. Maithili; *207d*, 55 ff. Maithili; *333*, 51 ff. Maithili.

Nirṇayaratnadīpikā. see RĀMALIṄGA s.o. Liṅgārya.

Nirṇaya-siddhānta. see RAGHURĀMA.

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Nirṇaya-siddhānta. निर्णयसिद्धान्त

Manuscript reference:
GUJARAT. iv. p. 130, *208*, 132 ff.

NITYĀNANDA s.o. Devadatta. (c. 1639 A.D.)

1. *Siddhāntarāja* or *Sarvasiddhāntarāja.* सिद्धान्तराज, सर्वसिद्धान्तराज

An astronomical work divided into two parts, *viz.*; *Gaṇitādhyāya* and *Golādhyāya*. In this work Nityānanda establishes the supremacy of the *Sāyaṇa* system over others.

Manuscript reference:
BANARAS. p. 260, *68*, 85 ff. 1879 A.D.
NWP. v. p. 202, *9*, 85 ff. Nāgarī.
RAS/BB/HV. *264*, 8 ff. Nāgarī. *Yantrādhyāya* only.

2. *Siddhānta-sindhu.* सिद्धान्तसिन्धु 1628 A.D.

Manuscript reference:
ANUP. v. p. 402, *928*, 28 ff.; *929*, 14 ff.

NṚSIṂHA s.o. Kṛṣṇa Daivajña and grandson of Divākara (1586 A.D.)

1. *Siddhānta-śiromaṇi-vāsanā-vārtika* or *Vāsanā-vārtika.* सिद्धान्तशिरोमणिवासनावार्तिक, वासनावार्तिक 1621 A.D.

A commentary on the *Gaṇitādhyāya* and the *Golādhyāya* sections of the *Siddhāntaśiromaṇi* of Bhāskarācārya.

Manuscript reference:
AS/KBK. p. 173, Bengali.
BANARAS. p. 259, *102*, 73 ff.; *103*, 147 ff.
BORS/AB. iii. *414*, 88 ff. Nāgarī. 1863 A.D.
CSC/HS & SG. ix, *166*, 107 ff. Bengali.
GUJARAT. iv. p. 208, *524*, 158 ff.
IO/AK. ii. part i, *6294*, 112 ff. Nāgarī. 1800 A.D. *Golādhyāya.*
IO/JE. v. *2857*, 133 ff. Nāgarī. 1751 A.D. *Gaṇitādhyāya; 2858*, 85 ff. Nāgarī. 1751 A.D. *Golādhyāya; 2859*, 87 ff. Nāgarī. *Gaṇitādhyāya*; *2860*, 58 ff, Nāgarī. *Golādhyāya; 2861*, 130 ff. Nāgarī. 1700 A.D. *Gaṇitādhyāya.*
OUDH. xi. p. 12, *6*, 312 ff. Nāgarī.
RAS/BB/HV, *282*, 111 ff. Nāgarī. 1778 A.D.; *286*, 74 ff. Nāgarī.
RTL/MS. p. 176, 68 ff. Kāśmīrī.

2. *Sūryasiddhānta-vāsanābhāṣya* or *Saurabhāṣya.* सूर्यसिद्धान्तवासनाभाष्य, सौरभाष्य 1611 A.D.

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A commentary on the *Sūryasiddhānta*.

Manuscript reference:
ANUP. v. p. 403, *946*, 101 ff. 1659 A.D.
BANARAS. p. 258, *123*, 67 ff.
BORS/AB. iii, *421*, 84 ff. Maithili; *426*, 21 ff. Maithili.
IO/AB. ii. part i, *6283*, ff. 29-77. Nāgarī. 1800 A.D.
IO/JE. v. *2778*, 204 ff. Nāgarī. c 1790 A.D.; *2779*, 88 ff. Nāgarī.
MAC/HW. p. 162, *3*, Nāgarī.
NOTICES/RM. v, *1838*, 121 ff. Maithili.
RORI/JM. ii. *4652*, 61 ff. 18th century.
TANJORE/PPS. xvi. *11660*, 49 ff. Nāgarī.
TCC/TA. p. 41, *193*, 144 ff. Nāgarī. 1805 A.D.
VVRI/VB. *4695*, 53 ff. Nāgarī. 1844 A.D.

3. *Tithicintāmaṇiṭīkā*. तिथिचिन्तामणिटीका

A commentary on the *Tithicintāmaṇi* of Gaṇeśa Daivajña.

Manuscript reference:
ANUP. iv. p. 361, *329*, 51 ff.
BIK/RM. *746*, 50 ff. Nāgarī.

NṚSIṂHA DAIVAJÑA s.o. Rāma Daivajña and grandson of Keśava. (1548 A.D.)

1. *Grahaḍīpikā*. ग्रहदीपिका

Manuscript reference:
ANUP. iv. p. 347, *127*, 5 ff. 1668 A.D.

2. *Grahakaumudī*. ग्रहकौमुदी

A small treatise on planetary motions in three chs. *viz.*, (i) Madhyamādhikāra, (ii) Spaṣṭagrahādhikāra and (ii) Caramādhikāra.

Manuscript reference:
IO/JE. v. *2945*, 3 ff. Nāgarī; *2946*, 71 ff. Nāgarī.

3. *Harṣakaumudī*. हर्षकौमुदी

A commentary on the *Grahalāghava* of Gaṇeśa Daivajña.

Manuscript reference:
ANUP. iv. p. 348, *138*, 41 ff.
VVRI/VB. *2654*, 88 ff. Nāgarī. 1759 A.D.

4. *Kheṭamuktāvalī*. खेटमुक्तावली

Manuscript reference:
ANUP. iv. p. 345, *98*, 38 ff. 1665 A.D.
CENSUS. *4724*, ff. 1-4, 7-9. Nāgarī.

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NṚSIṂHADATTA MIŚRA s.o. Haradatta Miśra. (c 1837 A.D.)

Makarandasāraṇyupapatti. मकरन्दसारण्युपपत्ति 1837 A.D.
A commentary on the *Makarandasāraṇī* of Makaranda.

Manuscript reference:
BORS/AB. iii, *250*, 10 ff. Maithili. 1858 A.D.

NṚSIṂHA DEVA.

Sūryasiddhānta-bhāsya. सूर्यसिद्धान्तभाष्य
A commentary on the *Sūryasiddhānta.*

Manuscript reference:
AS/KBK. p. 227, Bengali.
BN/AC. i, *998(I)*, Bengali. 1840 A.D.
CP/FK. p. 241, *181*, 136 ff.

NṚSIṂHA SŪRI s.o. Śiṅganārya.

Veṅkaṭādrināthīya-grahatantra. वेङ्कटाद्रिनाथीयग्रहतन्त्र
An astronomical work in 9 chs. *viz.*, (i) Madhyādhikāra, (ii) Sphuṭīkaraṇa, (iii) Tripraśnādhikāra, (iv) Somagrahaṇādhyāya, (v) Grahaṇādhyāya. (vi) Parilekhādhyāya, (vii) Śṛṅgonnatyadhikāra, (viii) Mahāvyatīpātavaidhṛtyadhikāra and (ix) Adhimāsa.

Manuscript reference:
TANJORE/PPS. xxvi, *11614*, 30ff. Nāgarī

OṂKĀRA BHAṬṬA.

Bhūgolasāra or Jyotiṣacandrikā. भूगोलसार, ज्योतिषचन्द्रिका
An astronomical work.

Manuscript reference:
PU. ii, *3745*, 28 ff. Nāgarī. 1880 A.D.

Printed text, translations etc.
Bhūgolasāra or *Jyotiṣacandrikā* by Oṃkāra Bhaṭṭa. Agra School Book Society. 1840.

Pādacchāyādinirūpaṇa. पादच्छायादिनिरूपण
An anonymous astronomical work used for calculating the length of the shadows by the help of *padas.*

Manuscript reference:
TANJORE/PPS. xvi, *11494*, 46 ff.

Pādamāna. पादमान
An anonymous work giving different measures of *padas.*

Manuscript reference:
TANJORE/PPS. xvi, *11495*, 4 ff. Nāgarī.

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PADMANĀBHA.

1. *Bhūvanadīpaka.* भूवनदीपक

An astronomical work.

Manuscript reference:
AS/KBK. p. 133, Bengali.

Commentator:
Siṃhatilaka Sūri.

Anonymous commentary:
Bhūvanadīpakaṭīkā.

2. *Grahaṇasambhavādhikāra.* ग्रहणसम्भवाधिकार

An astronomical work denoting the times of eclipses.

Manuscript reference:
GUJARAT. iv. p. 126, *67*, 48 ff.

PADMANĀBHA s.o. Narmada.

1. *Brahmasiddhāntaṭīkā.* ब्रह्मसिद्धान्तटीका

A commentary on the *Brahmasphuṭasiddhānta* of Brahmagupta.

Manuscript reference:
RORI/JM. ii, *6175*, 78 ff. 1700 A.D.

2. *Narmadaṭīkā.* नर्मदटीका

A commentary on the *Karaṇakutūhala* of Bhāskarācārya.

Manuscript reference:
BU/HV. *1355*, 72 ff. Nāgarī. incomplete.
GUJARAT. iv. p. 166, *298*, 31 ff. 1743 A.D.
IO/JE. v. *2928*, 75 ff. Nāgarī. 1817 A.D.
RAS/BB/HV. *220*, 36 ff. Nāgarī. 1658 A.D.; *221*, 35 ff. Nāgarī.

3. *Yantraratnāvalī.* यन्त्ररत्नावली

A work on astronomical instruments, the second chapter of which is called *Dhruvabhramaṇādhikāra* containing the description and use of an instrument for ascertaining the time of the night at any given moment from the position of the polar star. The work is accompanied by a commentary by the author himself.

Manuscript reference:
ANUP. iv. p. 364, *375*, 12 ff.; *376*, 10 ff.

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AS/HS & PS. x. *6900*, 14 ff. Nāgarī. 1809 A.D.; *6901*, 2 ff. Nāgarī. 1629 A.D.; *6902*, 13 ff. Nāgarī. 1809 A.D.
BIK/RM. *631*, 10 ff. Nāgarī.
BM/CB. *471*; *472*, 7 ff, Nāgarī. c. 1615 A.D.
CP/FK. p. 230, *64*, 2 ff.
FSM/TA. p. 86, *267*, 7 ff. 1796 A.D.
GUJARAT. iv. p. 180, *374*, 7 ff.
JRAS/1912. *76*, 32 ff. Nāgarī.
NWP. i. p. 508, *11*, 5 ff. Nāgarī; ii. p. 78, *6*, 14 ff. Nāgarī; viii. p. 58, *20*, 12 ff. Nāgarī; ix. p. 50, *29*, 12 ff. Nāgarī.
OUDH. ii. p. 10. *22*, 6 ff. Nāgarī.
PU. ii, *3571*, 8 ff. Nāgarī. 1822 A.D.; *3572*, 12 ff. Nāgarī.
RAS/BB/HV. *245*, 10 ff. Nāgarī. 1658 A.D.
RORI/JM. ii, *5751*, 9 ff. 1914 A.D.
VVRI/JB. *469*, 12 ff. Nāgarī. 1821 A.D.

Commentator:
Gaṇeśa Daivajña.

Padyapañcāśikā. see ŚRĪPATI.

Paitāmahasiddhānta. see VARĀHAMIHIRA.

Pañcabodha. see ŚAṄKARA.

PAÑCĀNANA.

Gaṇitarāja. गणितराज

Manuscript reference:
BN/AC. i. *957(I)*, Bengali. 1840 A.D.

Pañcāṅgabodha. पञ्चाङ्गबोध

An anonymous work used as a guide to calendar-makers.

Manuscript reference:
VVRI/VB. p. 77, *6188*, 132 ff. Tāmil.

Pañcāṅga-dīpikā. see VĀCASPATI.

Pañcāṅga-gaṇita. पञ्चाङ्गगणित

An anonymous work giving various mathematical rules used in the preparation of calendars.

Manuscript reference:
KANNADA. *896*, 62 ff. Kanarese.
MADRAS/D. xxiv, *13445*, 14 ff. incomplete; *13446*, 22 ff. Telugu. incomplete.
MADRAS/T. vol. i. part i. Sanskrit C, *663 (c)*, ff. 20a-25a. Grantha.

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OPPERT. i. *292*, 154 ff.
TAYLOR. i. p. 314, *1541*, ff. 34-143. Kanarese.

Pañcāṅgagaṇita (*Parahitagaṇita*). पञ्चाङ्गगणित (परहितगणित)
An anonymous work containing mathematical rules on almanacs.

Manuscript reference:
MADRAS/T. vol. x. Sanskrit A, *6066*, 28 ff. Grantha.

Pañcāṅga-gaṇita-viṣaya. पञ्चाङ्गगणितविषय
An anonymous work on almanac.

Manuscript reference:
MADRAS/D. xxiv. *13447*, 42 ff. Nāgarī.

Pañcāṅga-kalpalatā. पञ्चाङ्गकल्पलता
An anonymous work.

Manuscript reference:
MADRAS/D. xxiv. *13444*, 50 ff. Nāgarī.

Pañcāṅgamaṇimañjarī. see KEŚAVĀNANDA.

Pañcāṅga-nirṇaya-kaumudī. पञ्चाङ्गनिर्णयकौमुदी
An anonymous astronomical work used in the calculation of the pañcāṅgas, *viz.*, solar days, lunar days, nakṣatras, yogas and karaṇas.

Manuscript reference:
MADRAS/D. xxiv. *13448*, 68 ff. Telugu. 1861 A.D.

Pañcāṅgapatra. see RĀMA DAIVAJÑA.

Pañcāṅga-patrikā-sādhana-prakāra. पञ्चाङ्गपत्रिकासाधनप्रकार
An anonymous work on almanacs.

Manuscript reference:
PU. ii. *3610*, 14 ff. Nāgarī.

Pañcāṅgaphala. see ḌHUṆḌHIRĀJA s.o. Nṛsiṃha.

Pañcāṅga-ratnāvalī. पञ्चाङ्गरत्नावली
An anonymous work on almanacs.

Manuscript reference:
BN/AC. i, *979*, Nāgarī. 1613-14 A.D.
GUJARAT. iv. p. 152, *213*, 31 ff.

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Pañcāṅgasādhanā. see GAṆEŚA DAIVAJÑA

Pañcāṅgasādhanā. पञ्चाङ्गसाधना

An anonymous work on almanac.

Manuscript reference:

PU. ii. *3611*, 6 ff. Nāgarī.

Pañcāṅga-sādhana-paddhati. पञ्चाङ्गसाधनपद्धति

An anonymous work on almanac.

Manuscript reference:

MADRAS/D. supplemental xxviii. *15883*, 6 ff. Telugu.

Pañcāṅga-sādhana-saṅgati. पञ्चाङ्गसाधनसङ्गति

An anonymous work on almanac.

Manuscript reference:

MADRAS/D. xxiv. *13455*, 1 ff. incomplete.

MADRAS/T. vol. iv. part i. Sanskrit C, *3860(e)*, ff. 100a-114a. Grantha. incomplete.

Pañcāṅga-sarali. पञ्चाङ्गसरलि.

An anonymous work on almanac.

Manuscript reference:

MADRAS/T. vol. iii. part i. Sanskrit A, *2106*, 109 ff. Telugu incomplete.

Pañcāṅga-sarali. see RĀMEŚVARA s.o. Brahmaṇa.

Pañcāṅga-sārinī. पञ्चाङ्गसारिणी

An anonymous work containing tables on almanac.

Manuscript reference:

VVRI/VB. p. 78, *5660*, 86 ff, Nāgarī. incomplete.

Pañcāṅgasiddhi. see BĀBĀ DAIVAJÑA.

Pañcāṅgaśiromaṇi. see TRIPURĀRI.

Pañcāṅgatattva. see YOGI BHAṬṬA.

Pañcāṅgavākya. see VARARUCI.

Pañcāṅgavāsanā. see NĪLĀMBARA JHĀ.

Pañcāṅgavidyādharī. see VIDYĀDHARA.

Pañcāṅgopapatti. see GOKULANĀTHA DAIVAJÑA.

Pañcasiddhāntamata. see GAṄGĀDHARA.

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Pañcasiddhāntikā. see VARĀHAMIHIRA.

Pañcasiddhāntikāprakāśikā. see SUDHĀKARA DVIVEDIN

Pañcasiddhāntikāṭīkā. see SUDHĀKARA DVIVEDIN

Pañcāśikāṭīkā. पञ्चाशिकाटीका

An anonymous commentary on the *Pañcāśikā*, an astronomical work in 50 stanzas. This commentary refers to the *Bhāskarīya*, the (*Laghu*) *Mānasa* and the *Jayantamālā*.

Manuscript reference:

MADRAS/T. vol. iv. part i. Sanskrit C, *3731(c)*, ff. 9a-17a. Nāgarī. 1921-22 A.D. incomplete.

Pañcatārāspaṣṭīkaraṇasāraṇī. पञ्चतारास्पष्टीकरणसारणी

An anonymous work on almanac.

Manuscript reference:

RAS/BB/HV. *246*, 87 ff.

Pañcaviṃśaṭīkā. see ŚAMBHUDĀSA.

Pañjikārahasya. पञ्जिकारहस्य

An anonymous work on almanac.

Manuscript reference:

BN/AC. i. *972(III)*, Nāgarī. 1840 A.D.

Parahita. see HARIDATTA s.o. Śrīpati.

Parahitagaṇita. परहितगणित

An anonymous treatise on the preparation of calendar, based on the precepts of Vararuci.

Manuscript reference:

MADRAS/D. xxiv. *13456*, 13 ff. Grantha. incomplete; *13457*, 18 ff. Grantha & Tamil. incomplete.

Parahitasaṃhitā. See ŚRĪNĀTHA PAṆḌITA.

PARĀMA.

Kautukalīlāvatī. कौतुकलीलावती

Manuscript reference:

GUJARAT. iv. p. 120, *36*, 4 ff. 1823 A.D.

PARAMĀDĪŚVRA. see PARAMEŚVARA.

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PARAMĀNANDA.
Subodhacandrodaya-karaṇa. सुबोधचन्द्रोदयकरण

Manuscript reference:
VVRI/VB. *2437*, 11 ff. Nāgarī. 1603 A.D.

PARAMĀNANDA.
Makarandasāraṇī. मकरन्दसारणी
An astronomical table.
Manuscript reference:
NWP. i. p. 548, *117*, 25 ff. Nāgarī; ii. p. 142, *17*, 28 ff. Nāgarī.

PARAMĀNANDA ṬHĀKKURA of Khaṇḍavala family of Mithila.
Siddhāntasudhā. सिद्धान्तसुधा
An elementary treatise on astronomy.
Manuscript reference:
BORS/AB. iii. *416*, 10 ff. Maithili.

PARAMASUKHA.
Candragrahaṇodāharaṇa. चन्द्रग्रहणोदाहरण
An astronomical work on lunar eclipse.
Manuscript reference:
NWP. i. p. 572, *184*, 5 ff. Nāgarī.

PARAMASUKHA s.o. Sītārāma.
Bījavivṛtikalpalatā. बीजविवृतिकल्पलता
A commentary on the *Bījagaṇita* of Bhāskarācārya.
Manuscript reference:
NWP. i. p. 572, *185*, 50 ff. Nāgarī.

PARAMASUKHA.
Yantra-cintāmaṇi-vivṛti. यन्त्रचिन्तामणिविवृति
A commentary on the *Yantracintāmaṇi* of Cakradhara.
Manuscript reference:
NWP. i. p. 524, *57*, 30 ff. Nāgarī.

PARAMEŚVARA or Paramādīśvara, pupil of Rudra. (c. 1430 A.D.)
1. *Bhaṭadīpikā.* भटदीपिका
A commentary on the *Āryabhaṭīya* of Āryabhaṭa I.

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Manuscript reference:

IO/AK. ii. part i. *6271*, 95 ff. Malayalam. 1863 A.D.; *6272*, 45 ff. Malayalam. 19th century.

MADRAS/D. xxiv. *13394*, 132 ff. Grantha; *13395*, 106 ff. Grantha. Nāgarī.

Printed text, translations etc.

Āryabhaṭīya, with the commentary *Bhaṭadīpikā* of Parameśvara. Edited by H. Kern, Leiden. 1874 A.D.

Āryabhaṭīya. Parameśvarācāryakṛtaṭikayā samalaṅkṛta, with Hindi translation. Published by Udayanarayana Singh. Etawah. 1906 A.D.

2. *Dṛggaṇita.* दृग्गणित 1431 A.D.

An astronomical work.

Printed text, translations etc.

Dṛggaṇita. Published by K. V. Sarma. Vishveshvaranand Vedic Research Institute, Hoshiarpur. 1963.

3. *Goladīpikā.* गोलदीपिका 1443 A.D.

The work appears to be existing in two versions. One is a bigger work divided into 4 chs. *viz.*, (i) Golanibandhanavidhi, (ii) Grahacāranirūpaṇa, (iii) Bhūmyādicintana and (iv).... IO/AK. ii. *6300* and MADRAS/T. *5192* contain this version. The other version is probably an abridgement of the former, without any chapter division, contained in the Mss. IO/AK. *6298*, *6299*. This version is edited by T. Gaṇapati Śāstrī in TSS. 49. It is difficult to ascertain which version the other mss. contain.

Manuscript reference:

IO/AK. ii. part i, *6297*, 56 ff. Malayalam. 18th century; *6298*, 13 ff. Malayalam. 19th century; *6299*, 23ff. Malayalam. 19th century; *6300*, 32ff, Malayalam. 19th century.

MADRAS/T. vol. vi. part i. Sanskrit, *5192*, ff. 1-16a. Grantha. 1925-26 A.D.

PU. ii. *3337*, 22ff. Malayalam.

TRI/TG. i. p. 132. Malayalam.

Printed text, translations etc.

Goladīpikā. Edited by T. Gaṇapati Śāstrī. Trivendrum Sanskrit Series 49. Trivendrum. 1916.

Goladīpikā. Translated with commentary with English by K. V. Sarma. Adyar Library. Madras. 1957.

4. *Goladīpikāvivṛti.* गोलदीपिकाविवृति

A commentary on the previous work.

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Manuscript reference:
MADRAS/T. vol. vi. part i. Sanskrit, *5145*, 12ff. Nāgarī. 1925-26 A.D.

5. *Golasaṃsthāna.* गोलसंस्थान

Manuscript reference:
TRI/TG. iv. p. 81. Malayalam.

6. *Grahaṇāṣṭaka.* ग्रहणाष्टक

Manuscript reference:
TRI/TG. i. p. 135, Malayalam.

Printed text, translations etc.
Grahaṇāṣṭaka. Translated into English by K.V. Sarma, *JORM*, **28,** parts (i-iv), 47-60, 1961.

7. *Laghubhāskarīya-vyākhyā.* लघुभास्करीयव्याख्या
A commentary on the *Laghubhāskarīya* of Bhāskara I.

Manuscript refernce:
MADRAS/T. vol. v. part. i. Sanskrit A, *4206*, 58ff. Grantha.
TRI/TG. vii. p. 83. Tamil.

8. *Laghumānasagaṇitavyākhyā.* लघुमानसगणितव्याख्या
A commentary on the *Laghumānasa* of Mañjula.

Manuscript reference:
TRI/TG. i. p. 172. Malayalam.

9. *Līlāvatī-vyākhyā.* लीलावतीव्याख्या
A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:
MADRAS/T. vol. vi. part i. Sanskrit, *5160*, 43 ff. Nāgarī. 1925-26 A.D.; *5231* (*b*), ff 59a-96a. Malayalam.
TRI/TG. i. p. 173. Malayalam.

10. *Siddhāntadīpikā* or *Karmadīpikā.* सिद्धान्तदीपिका, कर्मदीपिका
A commentary on the *Mahābhāskarīya* of Bhāskara I.

Manuscript reference:
MADRAS/T. vol. iv. part i. Sanskrit C. *3842*, 40ff. Nāgarī. 1921-22 A.D.
TRI/KS. iv. *976*, 52ff. Malayalam.

11. *Sūryasiddhāntavyākhyā* or *Sūryasiddhāntavivaraṇa.*

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सूर्यसिद्धान्तव्याख्या, सूर्यसिद्धान्तविवरण

A commentary on the *Sūryasiddhānta*.

Manuscript reference:

IO/AK. ii. part i. *6286*, 52ff. Malayalam. 19th century.
RAS/MW. *139*, 70ff. Malayalam. c. mid-18th century.
VVRI/VB. *2069*, 45 ff. Malayalam.

PARĀŚARA.

Parāśarasiddhānta.

A work on astronomy expressing the three *Skandas viz.*, Gaṇita, Horā and Saṃhitā. A fragment of the work is also found in quotations of Varāhamihira's *Bṛhajjātaka*.

Manuscript reference:

AS/HS & PS. x. p. 122, *6957*, 9ff. Nāgarī. 1889 A.D.

Pārasīprakāśa. see VEDĀṄGARĀYA.

Pārasīprakāśavinoda. see VRAJABHŪṢAṆA.

Pārasīvinoda. see VRAJABHŪṢAṆA.

PARAŚURĀMA.

Līlāvatīvivaraṇa. लीलावतीविवरण

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

ANUP. iv. p. 386, *697*, 67ff. 1659 A.D.
AS/HS & PS. x. *6914*, 29ff. Nāgarī. incomplete.
GUJARAT. iv. p. 156, *234*, 73ff. incomplete.
PU. ii. *3908*, 74ff, Nāgarī; *3909*, 2ff. Nāgarī. incomplete.
VVRI/VB. *3318*, 36ff. Nāgarī; *3298*, 46ff. Nāgarī; *6154*, 19ff. Nāgarī.

Paribhāṣāpatra. परिभाषापत्र

An anonymous work which classified this astronomical and astrological terms under their different heads and serves as an index to Bhāskarācārya's *Siddhāntaśiromaṇi*, besides such works as the *Tājikasāra*, the *Śrīpatipaddhati*, Varāhamihira's *Laghujātaka* and *Bṛhajjātaka* and Makaranda's tables.

Manuscript reference:

IO/JE. v. *2976*, 59ff. Nāgarī.

Parivṛtti. परिवृत्ति

An anonymous work.

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Manuscript reference:
OPPERT. i. *80.*

Parvasambhava. see JAGANNĀTHA.

Pātasaṃsādhana. see GAṆEŚA DAIVAJÑA s.o. Keśava Daivajña.

Pātasāriṇī. see GAṆEŚA DAIVAJÑA s.o. Keśava Daivajña.

Pātasāriṇīṭīkā. see DIVĀKARA s.o. Nṛsiṃha.

Pātasāriṇīṭīkā. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

Pāṭīgaṇita. see ŚRĪDHARĀCĀRYA.

Pāṭīgaṇita. see VĪREŚVARA.

Pāṭīgaṇitasāra. see ŚRĪDHARĀCĀRYA.

Pāṭīgaṇitaṭīkā. see ŚRĪDHARĀCĀRYA.

Pāṭīlīlāvatīṭīkā. see DĀMODARA.

Pāṭīlīlāvatīvṛtti. पाटीलीलावतीवृत्ति

An anonymous commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:
GUJARAT. iv. p. 156, *235*, 70ff.

Pāṭīlīlāvatyāḥ Bhūṣaṇam. see RĀMACANDRA.

Pāṭīsāra. see MUNĪŚVARA.

Pāṭīsāra. see ŚRĪDHARĀCĀRYA.

Pāṭīsāraṭīkā. see VṚNDĀVANA ŚUKLA.

Pāṭīvyākhyāna. see VĪREŚVARA.

Patradīpikā. see BALABHADRA.

Patraprakāśa. see BALABHADRA.

Patra-prakāśa. पत्रप्रकाश

An anonymous astronomical work containing tables based on the *Sūryasiddhānta.*

Manuscript reference:
MAC/HW. p. 166, *32*, Nāgarī.

Pauliśasiddhānta. see VARĀHAMIHIRA's *Pañcasiddhāntikā.*

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Prabhā. see ŚRĪNIVĀSA.

Prabodhinī. प्रबोधिनी

An anonymous commentary on the *Grahaṇādarśa* of Buddha Siṃha.

Manuscript reference:

PU. ii. *3345*, 42ff. Nāgarī. 1818 A.D.

Prajñāprakāśa. see ŚĀRṄGADHARA.

PRAKĀŚĀDITYA.

Laghumānasodāharaṇa. लघुमानसोदाहरण

A commentary on the *Laghumānasa* of Mañjula.

Manuscript reference:

BANARAS. p. 263, *119*, 12ff.

Prakīrṇa-saṃgraha. प्रकीर्णसंग्रह

An anonymous treatise on the preparation of calendars in 3 chs.

Manuscript reference:

MADRAS/T. vol. vi. part i. Sanskrit, *5191*, 6ff. Grantha. 1925-26 A.D.

PRASANNAKARAṆA.

Karaṇatantra. करणतन्त्र

An astronomical work.

Manuscript reference:

OUDH. i. p. 12, *1*, 7ff. Nāgarī.

Pratibhāga. प्रतिभाग

An anonymous treatise on the preparation of calendars.

Manuscript reference:

MADRAS/T. vol. iii. part i. Sanskrit A, *1042* (*a*), ff. 1a-4a. Telugu; vol. iii. part i. Sanskrit B, *2454* (*e*); *2454* (*f*); *2454*(*g*).

Pratodayantra. see GAṆEŚA DAIVAJÑA s.o. Keśava Daivajña.

Prayogaracanā. प्रयोगरचना

An anonymous commentary on the *Mahābhāskarīya* of Bhāskara I.

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Manuscript reference:
MADRAS/T. vol. iii. part i. Sanskrit A, *3034*, 41ff. Nāgarī. 1919-20 A.D.

PREMA DAIVAJÑA or Prema Miśra or Premanātha. (c. 1656 A.D.)

Grahalāghava-sāraṇī or *Grahalāghava-laghusāraṇikā.* ग्रहलाघवसरणी, ग्रहलाघवलघुसारणिका. 1656 A.D.

A short astronomical work, containing tables based on the *Grahalāghava* of Gaṇeśa Daivajña.

Manuscript reference:
AS/HS & PS. x. *6858*, 14ff. Nāgarī.
CP/HL. p. 147. *1583*; *1584*.
MADRAS/D. xxiv. *13418*, 37ff. Nāgarī.
OUDH (1890). p. 112, *47*, 28ff. Nāgarī.

PREMA MIŚRA. see PREMA DAIVAJÑA.

PṚTHŪDAKASVĀMIN s.o. Śrībhaṭṭa Madhusūdana. (c. 864 A.D.)

1. *Brahmasiddhānta-vāsanābhāṣya.* ब्रह्मसिद्धान्तवासनाभाष्य.

A commentary on the *Brahmasiddhānta* of Brahmagupta.

Manuscript reference:
IO/JE. v. *2769*, 292ff. Nāgarī; 2770, 197ff. Nāgarī.
VVRI/VB. *1781*, 175 ff. Nāgarī. incomplete.

2. *Khaṇḍakhādyaka-vivaraṇa.* खण्डखाद्यकविवरण

A commentary on the *Khaṇḍakhādyaka* of Brahmagupta.

Manuscript reference:
BERLIN. ii. part i, *1734*, 24ff.
GUJARAT. iv. p. 120, *37*, 46ff.

Printed text, translations etc.

Khaṇḍakhādyaka
Published by Prabodh Chandra Sen Gupta, Calcutta University, 1941. The Berlin Ms was utilized in preparing the edition. The author also had access to another Ms made available from the Deccan College. The Calcutta University possesses another Ms. All these manuscripts are reported by the editor to be the same, even in respect of omissions and errors.

PURUṢOTTAMA BHAṬṬA, pupil of Rāmacandra, the author of *Rāmavinoda.* (c. 1631 A.D.) The name of his father is given as Kṛṣṇa in AS/HS & PS. x. *6895* and as Śrīṣmāja in BORS/AB. iii. *246*.

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Abhinavûtāmarasa or *Makarandabhāṣya*. अभिनवतामरस, मकरन्दभाष्य 1631 A.D.

A commentary on the *Tithipatra* of Makaranda.

Manuscript reference:

AS/HS & PS. x. *6895*. 5ff. Nāgarī. 1827 A.D.; *6898*, 11ff. Nāgarī. 1762 A.D.
BORS/AB. iii. *246*, 6ff. Maithili. 1830 A.D.
IO/JE. v. *2958*, 16ff. Nāgarī; *2959*, 8ff. Nāgarī.
LEIPZIG/TA. *982*, 28ff. c. 1820 A.D. incomplete.
VVRI/VB. *2620*, 10ff. Nāgarī. 1766 A.D.

PURUṢOTTAMA DEVA.

Hārāvalīkośa. हारावलीकोश

A lexicon particularly dealing with the technical terms in astronomy.

Manuscript reference:

TANJORE/PPS. xvi. *11672*, 74 ff. Grantha.

PŪRVADHARA.

Joisakaraṇḍaka (*Jyotiṣakaraṇḍaka*). जोइसकरण्डक (ज्योतिषकरण्डक)

An important Jaina manual on astronomy in Prākṛt. This work has been codified at the Valabhī Council and is regarded as the 9th of the supernumerary *Prakīṛṇakas*.

Manuscript reference:

BORI/DC. xvii (Ia), *391*, 102ff. Nāgarī; 392, ff. 71+127. Nāgarī. 1874 A.D.; *393*, 145 ff. Nāgarī. 1583 A.D.; *394*, 5ff. Nāgarī.

Commentator:

Malayagiri Sūri.

Printed text, translations etc.

Jyotiṣakaraṇḍa with the commentary by Malayagiri Sūri, published by Ṛṣabhadās Kesarimaljī Saṃsthā. Rutlam. 1920.

RĀGHAVA *alias* Appājīpanta Khāṇḍekara.

Kheṭakṛti. खेटकृति

An astronomical work in 15 chs.

Manuscript reference:

RAS/BB/HV. *227*, 39ff. Nāgarī. 1810 A.D.

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RĀGHAVĀNANDA CAKRAVARTIN. (c. 1599 A.D.)

1. *Dinacandrikā.* दिनचन्द्रिका 1599 A.D.

A set of astronomical tables with brief remarks for the construction of a calendar.

Manuscript reference:

AS/HS & PS. x. *6876*, 49ff. Nāgarī.

IO/JE. v. *2968*, 29ff. Bengali.

Printed text, translations etc.

Dinacandrikā, edited with Bengali translation by Durgācaraṇa Kaviratna. Berhampur. 1878 A.D.

Dinacandrikā, with annotations and Bengali translation by Bhagavatī Caraṇa Smṛtitīrtha. Calcutta. 1914 A. D.

Dinacandrikā, with annotations and Bengali translation by Bhagavatī Caraṇa Smṛtitīrtha. edited by Rāmadeva Smṛtitīrtha. Calcutta. 1935 A.D.

2. *Sūryasiddhāntarahasya.* सूर्यसिद्धान्तरहस्य 1591 A.D.

A commentary on the *Sūryasiddhānta.*

Manuscript reference:

AS/KBK. p. 227, Bengali.

BN/AC. i. *791 (iii)*, Bengali. 19th century; *997 (iii)*, Bengali. 1788 A.D.

TCC/TA. p. 46. 20ff. Bengali. 17th century.

RĀGHAVENDRA ŚARMAN.

Jyotiḥsāra. ज्योतिःसार

An astronomical work.

Manuscript reference:

TCC/TA. p. 79. 18ff. Bengali.

VSP. p. 261, *1253*, ff. 1-7, 16-24. Bengali. 1832 A.D. incomplete.

RAGHUNĀHA of Nungambakam.

Dṛggaṇita. दृग्गणित

An astronomical work dealing with the preparation of the calendar by means of direct observations of the heavenly bodies. The author is the originator of what is now called 'Nungambakam calendar'.

Manuscript reference:

MADRAS/D. xxiv. *13431*, 3ff. Telugu. incomplete.

RAGHUNĀTHA. (16th century.)

Grahakalpataru. ग्रहकल्पतरु

Planetary tables.

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Manuscript reference:
AS/HS & PS. x. *6846*, 38ff. Nāgarī. *1589* A.D.

RAGHUNĀTHA.
Kheṭataraṅgiṇī. खेटतरङ्गिणी
Manuscript reference:
GUJARAT. iv. p. 120, *42*, 4ff. 1843 A.D.

RAGHUNĀTHA.
Jyotissiddhāntasāra. ज्योतिस्सिद्धान्तसार
The work is a translation of a *Yavana* (Greek) astronomical work.
Manuscript reference:
NWP. i. p. 560, *154*, 60ff. Nāgarī.

RAGHUNĀTHA & VEṄKAṬEŚA.
Tattvavivekavyākhyā. तत्त्वविवेकव्याख्या
A commentary on the *Siddhāntatattvaviveka* of Kamalākara.
Manuscript reference:
PU. ii. *3491*, 40ff. Nāgarī. incomplete.

RAGHUNĀṬHA.
Gaṇitakaraṇa (*Bālabodha*). गणितकरण (बालबोध)
Manuscript reference:
ANUP. iv. p. 346, *102*, 7ff.

RAGHUNĀTHA BHAṬṬA s.o. Somanātha. (c. 1565 A.D.)
Maṇipradīpa. मणिप्रदीप 1565 A.D.
Manuscript reference:
BORS/AB. iii. *253*, 7ff. Maithili.
NOTICES/HS. iv. *206*, 10ff. Nāgarī.
NWP. ix. p. 52, *40*, 9ff. Nāgarī.
Anonymous commentary:
Maṇipradīpodāhāraṇa.

RAGHURĀMA.
Nirṇaya-siddhānta. निर्णयसिद्धान्त
An astronomical work.
Manuscript reference:
CP/HL. p. 242, *2603*; *2604*.

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RĀJACANDRA. (c. 1750 A. D.)

Siddhāntaratnāvalī. सिद्धारत्नन्तावली 1750 A.D.

An astronomical work.

Manuscript reference:

AS/HS & PS. x. *6931*, 6ff. Bengali. 19th century. incomplete.

RĀJANĀRĀYAṆA. (c. 1789 A.D.)

Siddhāntaratnāvalī. सिद्धान्तरत्नावली 1789 A.D.

A karaṇa work.

Manuscript reference:

AS/HS & PS. x. *6930*, 5ff. Bengali. 19th century. incomplete.

RĀJAGIRI PRAVĀSĪ.

Vāsanābhāṣya. वासनाभाष्य

A commentary on the *Gaṇitādhyāya* of the *Siddhāntaśiromaṇi* of Bhāskarācārya.

Manuscript reference:

OUDH. xiii. p. 60, *8*, 128ff. Nāgarī.

RĀMA.

Līlāvatīvyākhyā or *Karmadīpikā.* लीलावतीव्याख्या, कर्मदीपिका

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

BORS/AB. iii, *325*, 17ff. Maithili. incomplete.
PU. ii. 3919, 7ff. Nāgarī.

RĀMA s.o. Gaṇeśa, grandson of Dhanvantari and a resident of Cambay.

Kautukacintāmaṇi. कौतुकचिन्तामणि

A voluminous treatise dealing with astronomical as well as astrological topics.

Manuscript reference:

RAS/BB/HV, *226*, *285*ff. Nāgarī.

RĀMA or Rāmacandra s.o. Vidyādhara.

Kautukalīlāvatī. कौतुकलीलावती

Manuscript reference:

AS/HS & PS. x. *6833*, 9ff. Nāgarī. 19th century.
BIK/RM. *670*, 8ff. Nāgarī.
LEIPZIG/TA. *986*, 4ff. c. 1780 A.D. lacks beginning.

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RĀMA ĀCĀRYA.

Karaṇakesarī. करणकेसरी

Manuscript reference:

GUJARAT. iv. p. 116, *18*, 1763 A.D.
NWP. x. p. 52, *30*, 2ff. Nāgarī.

RĀMACANDRA.

Kātyāyanaśulbavyākhyā. कात्यायनशुल्वव्याख्या

A commentary on the *Śulbasūtra* of Kātyāyana.

Manuscript reference:

BU/HV. p. 23, *122*, 48ff. Nāgarī. 1859 A.D.
PU. i. p. 134, *53*, 40ff.

RĀMACANDRA.

Pāṭīlīlāvatyāḥ Bhūṣaṇam. पाटीलीलावत्याः भूषणम्

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

GUJARAT. iv. p. 156, *233*, 75ff. incomplete.

RĀMACANDRA.

Kheṭabhūṣaṇa. खेटभूषण

Manuscript reference:

GUJARAT. iv. p. 120, *44*, 11ff. 1634 A.D.

RĀMACANDRA.

Gaṇitāmṛtakūpikā. गणितामृतकूपिका

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

NWP. viii. p. 59, *21*, 163ff. Nāgarī; ix. p. 46, *6*, 120ff. Nāgarī.

RĀMACANDRA.

Yantrādhyāyavivṛti. यन्त्राध्यायविवृति

Manuscript reference:

GUJARAT. iv. p. 379. 11ff.

RĀMACANDRA.

Yantraprakāśa or *Yantraprakāśaṭīkā.* यन्त्रप्रकाश, यन्त्रप्रकाशटीका

A treatise on astronomical instruments. The following topics are described: Uttaraphālgunīcakra, Ravicakra, Candracakra, Maṅgalacakra, Budhacakra, Gurucakra, Śukracakra,

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Śanicakra, Rāhucakra, Ketucakra, Aśvinīcakra, Bharaṇīcakra, Kṛttikācakra, Punarvasucakra, Sulabhayantra, Phalakayantra, Valayayantra, Cūḍāyantra, Nāḍīvalayayantra, Khaḍgaśarādiyantra, Cintāmaṇiyantra, Kapālayantra, Rādhāvedhayantra, Ghaṭīyantra, Haṃsayantra, Nālakayantra, Kācaghaṭiyantra.

Manuscript reference:
AS/HS & PS. x. *6899*, 93ff. Nāgarī.

RĀMACANDRA BHAṬṬĀCĀRYA.

Ravīndvorgrahaṇopāya. रवीन्द्वोर्ग्रहणोपाय

An astronomical work on solar and lunar eclipses.

Manuscript reference:
NOTICES/HS. iv, *232*, 4ff. Bengali.

RĀMA DAIVAJÑA. (c. 1625 A.D.)

Vīramitrodaya. वीरमित्रोदय

A karaṇa work.

Manuscript reference:
AS/HS & PS. x. *6928*, 54ff. Nāgarī.

Commentator:
Śiva.

RĀMA DAIVAJÑA, *alias* Rāmabhaṭa, *alias* Rāmacandra, s.o. Ananta Daivajña.

Rāmavinodakaraṇa or *Pañcāṅgapatra.* रामविनोदकरण, पञ्चाङ्गपत्र

An astronomical treatise dealing with the computation of the calendars, in 11 chs. based on the *Sūryasiddhānta*. This work was written at the instance of Mahārājā Rāmadāsa, a minister in the court of Ākbar.

Manuscript reference:
AS/HS & PS. x. *6907*, 3ff. Nāgarī. 1827 A.D.
BANARAS. p. 264, *97*, 307ff.
BIK/RM. *712*, 355ff. Nāgarī.
BU/HV. *1420*, 15ff. Nāgarī; *1421*, 4ff. Nāgarī.
IO/JE. v. *2944*, 8ff. Nāgarī. 1807 A.D.
MAC/HW. p. 166, *33*, Nāgarī.
NWP. ix. p. 48, *26*, 249ff. Nāgarī.
PU. ii. *3864*, 5ff. Nāgarī.
RORI/JM. ii, *7512*, 13ff. 1755 A.D.
TANJORE/PPS. xvi. *11579*, 8ff. Nāgarī.
UDAIPUR. p. 124, *516*, *517*.
VVRI/VB. *2272*, 4ff. Nāgarī.

Commentator:
Viśvanātha Daivajña.

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RĀMA DAIVAJÑA s.o. Madhusūdana of Pārthapura on the banks of the Godāvarī. (c. 1615 A.D.)

Yantradīpikā or *Yantracintāmaṇiṭīkā*. यन्त्रदीपिका, यन्त्रचिन्तामणिटीका

A commenttary on the *Yantracintāmaṇi* of Cakradhara. The BU/GD Ms. noted below erroneously reads the author's name as Kṛṣṇa, s.o. Madhusūdana.

Manuscript reference:

ANUP. iv. p. 379, *602*, 18ff. 1650 A.D.; *603*, 24ff; *604*, 10ff. 1690 A.D.
AS/HS & PS. x. *6903*, 25ff. Nāgarī. 1842 A.D.; *6904*, 16ff. Nāgari. 1672 A.D., *6905*, 11ff. Nāgarī; *6906*, 24ff. Nāgarī.
BANARAS. p. 267, *116*, 12ff.
BU/GD. i. *376*, 12ff. Nāgarī.
IO/JE. v. *2910*, 16ff. Nāgarī. 1761 A.D.
NWP. i. p. 570, *177*, 50ff. Nāgarī.
OUDH. vi. p. 10, *14*, 47ff. Nāgarī.
RORI/JM. ii. *6108*, 29ff. 1854 A.D., *6885*, 36ff. 1903 A.D.; *5317*, 16ff. 1845 A.D., *5619*, 13ff. 1895 A.D.
VVRI/VB. *5299*, 14ff. Nāgarī. 1875 A.D.

RĀMADATTA.

Ayanavāda. अयनवाद

Manuscript reference:

NWP. i. p. 550, *123*, 9ff. Nāgarī.

RĀMADATTA.

Gaṇakabhūṣaṇaṭīkā. गणकभूषणटीका

A commentary on the *Gaṇakabhūṣaṇa*, an anonymous work.

Manuscript reference:

NWP. i. p. 550, *125*, 40ff. Nāgarī.

RĀMADATTA.

Līlāvatīṭippana. लीलावतीटिप्पन

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

NWP. i. p. 518, *37*, 90ff. Nāgarī.

RĀMADATTA.

Makarandasāraṇī. मकरन्दसारणी

An astronomical table based on Makaranda's work.

Manuscript reference:

NWP. i. p. 554, *137*, 35ff. Nāgarī.

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RĀMADATTA.

Ṣoḍaśayogīṭīkā. षोडशयोगीटीका

A commentary on the *Ṣoḍaśayogī* of an anonymous author.

Manuscript reference:

NWP. i. p. 550, *124*, 13ff. Nāgarī

RĀMADAYĀLU s.o. Yaśavanta.

Grahaprakāśa or *Grahaprakāśakaraṇa.* ग्रहप्रकाश, ग्रहप्रकाशकरण

Manuscript reference:

PU. ii. *3348*, 11ff. Nāgarī. 1830 A. D.; *3349*, 76ff. Nāgarī.

RĀMAKIṄKARA BHAṬṬĀCĀRYA.

Grahacāraṭīkā. ग्रहचारटीका

A commentary on the *Grahacāra* of Kevalarāma.

Manuscript reference:

IO/JE. v. *2965*, 68ff. Bengali.

RĀMAKṚṢṆA s.o. Lakṣmaṇa, grandson of Nṛsiṃha and pupil of Somanātha.

1. *Bījaprabodha.* बीजप्रबोध

A commentary on the *Bījagaṇita* of Bhāskarācārya.

Manuscript reference:

IO/JE. v. *2832*, 196ff. Nāgarī

LEIPZIG/TA. *964*, 11ff. c 1770. only the beginning portion.

2. *Gaṇitādhyāyaṭīkā.* गणिताध्यायटीका

A commentary on the section *Gaṇitādhyāya* of the *Siddhāntaśiromaṇi* of Bhāskarācārya. At the beginning of his commentary Rāmakṛṣṇa says that his teacher wrote a commentary entitled *Dīpikā* on the four parts of the *Siddhāntaśiromaṇi* and that he follows him in making his own commentaries on the four parts. But his commentary on the *Golādhyāya* has not been noticed so far.

Manuscript reference:

LEIPZIG/TA. *966*, 51ff. c 1700 A. D. incomplete. Contains Trīpraśnādhikāra, Candragrahaṇādhikāra, Sūryagrahaṇādhikāra and Grahodayāstādhikāra only.

3. *Gaṇitāmṛtalaharī* or *Līlāvatīvṛtti* or *Līlāvatīṭīkā.* गणितामृतलहरी, लीलावतीवृत्ति, लीलावतीटीका

A commentary on the *Līlāvati* of Bhāskarācārya. IO/JE. v.

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gives the date of *Gaṇitāmṛtalaharī* as 1338 A. D. whereas RAS/BB/HV and LEIPZIG/TA give it as 1688 A. D.

Manuscript reference:
IO/JE. v. *2804*, 90ff. Nāgarī. 1813 A.D.; *2805*, 96ff. Nāgarī. 1914 A.D.
LEIPZIG/TA. *962*, 7ff. 100 A.D. Fragment.
RAS/BB/HB. *271*, 50ff. Nāgarī.

RĀMAKṚṢṆA

Karapañcāṅga. करपञ्चाङ्ग
A small manual consisting of 21 verses teaches how to prepare a pañcāṅga according to the system of Babba Sūri.

Manuscript reference:
RAS/BB/HV. *225*, 8ff. Nāgarī.

RĀMAKṚṢṆA BHAṬṬA, s.o. Kendra Bhaṭṭa and grandson of Prayāga Bhaṭṭa.

Tattvaprakāśikā. तत्त्वप्रकाशिका
A commentary on the *Bhāsvatī* of Śatānanda.

Manuscript reference:
AS/HS & PS. x. *6890*, 73ff. Nāgarī. 1804 A.D.
CENSUS. *4783*, ff. 3-24. Nāgarī.
OUDH. iii. p. 14, *5*.

RĀMAKṚṢṆA DEVA, s.o. Sadāśiva Āpadeva and grandson of Śrīpatideva.

Manorañjanā or *Vidvanmanorañjanā* or *Līlāvatīvivaraṇa.* मनोरञ्जना, विद्वन्मनोरञ्जना, लीलावतीविवरण
A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:
AS/HS & PS. x. *6915*, ff. 21-62. Nāgarī.
AS/KBK. p. 186. Bengali.
IO/JE. v. *2816*, 59ff. Nāgarī. c 1750 A.D.; *2817*, 46ff. Nāgarī.
PU. ii. *3913*, 60ff. Nāgarī. 1786 A.D.; *394*, 30ff. Nāgarī. incomplete.
RORI/JM. ii. *5704*, 93ff.

RĀMALIṄGA, s.o. Lingārya.

Nirṇayaratnadīpikā. निर्णयरत्नदीपिका
An astronomical treatise on the preparation of the calendar.

Manuscript reference:
MADRAS/T. vol. ii. part i. Sanskrit A, *1317*, 141ff. Telugu.

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RĀMA ŚARMAN.

Jyotiṣapradīpa. ज्योतिषप्रदीप

An astronomical work.

Manuscript reference:

BN/AC. i. *975*, 79ff. Bengali.

Rāmavinodakaraṇa. see RĀMA DAIVAJÑA.

Rāmavinodaprakāśapaddhati. see DIVĀKARA s.o. Nṛsiṃha.

Rāmavinodasāriṇī. रामविनोदसारिणी

An anonymous work containing astronomical tables based on the *Rāmavinoda* of Rāma Daivajña.

Manuscript reference:

VVRI/VB. p. 79, *4534*, 20ff. Nāgari. incomplete.

Rāmavinododāharaṇa. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

RĀMEŚVARA.

Bhāsvatīṭīkā. भास्वतीटीका

A commentary on the *Bhāsvatī* of Śatānanda.

Manuscript reference:

NWP. i. p. 568, *171*, 21ff. Nāgarī.

RĀMEŚVARA, s.o. Brahman

Pañcāṅgasarali. पञ्चाङ्गसरलि

Manuscript reference:

MADRAS/T. vol. iii. part i. Sanskrit A, *2298*, 60ff. Grantha and Telugu. incomplete.

RĀMEŚVARA MIŚRA, s.o. Manirāma Miśra.

Līlāvatīṭīkā. लीलावतीटीका

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

AS/HS & PS. x. *6912*, 24ff. Nāgarī. 19th century. incomplete.

RAṄGANĀTHA.

Siddhānta-śiromaṇi-marīci. सिद्धान्तशिरोमणिमरीचि

A commentary on the *Siddhāntaśiromaṇi* of Bhāskarācārya.

Manuscript reference:

RORI/JM. ii. *5666*, 183ff. 17th century.

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RAṄGANĀTHA, s.o. Ballāla and father of Munīśvara. (c. 1603 A.D.)

Gūḍhārthaprakāśikā. गूढार्थप्रकाशिका 1603 A.D.

A commentary on the *Sūryasiddhānta.*

Manuscript reference:

AS/KBK. p. 227, Bengali; another copy in Nāgarī.
BN/AC. i. *998(II)*, Bengali. 1840 A.D.
BORS/AB. iii. *45*, 57ff. Maithili.
IO/JE. v. *2775*, ff. 176+47+27. Nāgarī. 19th century; *2776*, ff. 11+34, Nāgarī; *2776*, ff. 110+32+14. Nāgarī. 1792 A.D.
OUDH. vii. p. 2, *2*, 222ff. Nāgarī.
PU. ii. *4072*, 158ff. Nāgarī. *Pūrvakhaṇḍa* only; *4073*, ff. 77-140, Nāgarī. 1670 A.D. from the middle of *Grahaṇādhyāya* to the end.
RAS/BB/HV. *295*, ff. 64+20. Nāgarī. *296*, 108ff. Nāgarī.
RORI/JM. ii. *5639*, 186ff. 1906 A.D. *Pūrvakhaṇḍa* only.
RTL/MS. p. 177, 230ff.
VVRI/VB. *2664*, 28ff. Nāgarī. *Uttarakhaṇḍa* only.

Printed text, translations etc.

Gūḍhārthaprakāśikā with the *Sūryasiddhānta.* Ed. by Fitz Edward Hall and Bāpūdeva Śāstrī, *Bibliotheca Indica* No. 25, Calcutta. 1859.
Gūḍhārthaprakāśikā with the *Sūryasiddhānta.* Ed. by Jīvānanda Bhattācārya Vidyāsāgara, Calcutta, 1891.
Gūḍhārthaprakāśikā with the *Sūryasiddhānta.* Ed. with a Hindi translation by Baladevaprasād Miśra, Kalyan, 1924.

RAṄGANĀTHA, s.o Nṛsiṃha Daivajña, grandson of Kṛṣṇa Daivajña and brother of Divākara and Kamalākara. (c. 1643 A.D.)

1. *Bhaṅgīvibhaṅgīkaraṇa.* भङ्गीविभङ्गीकरण

In this work, the author attempts to refute Munīśvara's method of finding the true places of planets.

Manuscript reference:

BANARAS. p. 261, *110*, 8ff.

2. *Lohagolakhaṇḍana.* लोहगोलखण्डन

Manuscript reference:

BANARAS. p. 261, *108*, 3ff.

3. *Mitabhāṣiṇī* or *Līlāvatīvilāsa.* मितभाषिणी, लीलावतीविलास

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

AS/KBK. p. 168, Bengali.

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IO/JE. v. *2814*, 89ff. Nāgarī; *2815*, 40ff. Nāgarī.
MADRAS/D. xxiv. *13486*, 55ff. Grantha; *1387*, 96ff.

4. *Siddhāntacūḍāmaṇi*. सिद्धान्तचूडामणि 1643 A.D.
A small work on astronomy in 12 chs.

Manuscript reference:
AS/KBK. p. 223, Nāgarī.
CSC/HS & SG. ix. *161*, 16ff. Bengali.
NWP. x. p. 48, *3*, 17ff. Nāgarī; *4*, 25ff. Nāgarī.

Rasālā. see BHARATA, s.o. Yaśodhara.

Rāśi-nighaṇṭu. राशिनिघण्टु
An anonymous work

Manuscript reference:
MADRAS/D. xxiv. *13880-13893*.
MADRAS/T. vol. iii. part i. Sanskrit B, *2533(n)*, ff. 78a-b. Telugu; vol. iv. part i. Sanskrit C, *3943(g)*, ff. 59a b. Grantha.

RATNAKAṆṬHA.
Adhimāsodāharaṇa. अधिमासोदाहरण

Manuscript reference:
JRAS/1912. *261g*, 5ff. Śāradā. 19th century.

RATNĀKARA.
Yantracintāmaṇi. यन्त्रचिन्तामणि

Manuscript reference:
OUDH. ii. p. 12, *50*, 6ff. Nāgarī.

Ratnamālāṭīkā. see VAIJYANĀTHA.

Ravīndvorgrahaṇopāya. see RĀMACANDRA BHAṬṬĀCĀRYA.

Ravisiddhāntamañjarī. see MATHURĀNĀTHA VIDYĀLAṄKĀRA.

Ravyādicakra. रव्यादिचक्र
An anonymous work.

Manuscript reference:
MADRAS/D. xxiv. *13470*, 7ff. Telugu.

Ravyādigatibheda. रव्यादिगतिभेद
An anonymous work, full of tables showing the differences in time in the movements of the planets.

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Manuscript reference:
MADRAS/D. xxiv. *13469*, 24ff. Telugu.

Ravyādijyāgaṇita. रव्यादिज्यागणित
An anonymous work.
Manuscript reference:
MADRAS/T. vol. iv. part i. Sanskrit C, *3943(e)*, ff. 49a-54b. Grantha. incomplete.

Ravyādijyāvākya. रव्यादिज्यावाक्य
This anonymous work gives the sines for determining the position of the sun and the planets.
Manuscript reference:
MADRAS/D. xxiv. *13471*, 13ff. Grantha; *13472*, 16ff. Grantha & Tamil.

Ravyādimandapadakāni. रव्यादिमन्दपदकानि
An anonymous work.
Manuscript reference:
MADRAS/D. supplemental xxviii. *15884*, 30ff. Telugu.

Ravyādisphaṭa. रव्यादिस्फुट
An anonymous work.
Manuscript reference:
MADRAS/D. xxiv. *13473*, 9ff. Telugu.

Rekhāgaṇita. see JAGANNĀTHA.

Rekhāgaṇita. रेखागणित
An anonymous Sanskrit translation of Euclid's Geometry; contains only Books I & IV.
Manuscript reference:
BC/HS. *28*, ff. 3-102. Nāgarī.

Rekhāgaṇita-kṣetravyavahāra. see JAGANNĀTHA.

Rekhālakṣaṇa. रेखालक्षण
An anonymous work.
Manuscript reference:
TRI/TG. iii. p. 44, Malayalam.

Rekhāpradīpa. see KEVALARĀMA.

Rekhāpratīti. रेखाप्रतीति
An anonymous work.

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Manuscript reference:
GUJARAT. iv. p. 188, *415.*

Rekhā-śāstra. रेखाशास्त्र
An anonymous work.

Manuscript reference:
TRI/TG. vii. p. 82, Malayalam.

Romakaśiddhānta or *Romaśasiddhānta.* रोमकसिद्धान्त, रोमशसिद्धान्त 3rd. century A.D.

An anonymous siddhānta-work resembling the *Sūryasiddhānta* in 11 chs., *viz.*, (i) Madhyamādhikāra, (ii) Sphuṭādhikāra, (iii) Tripraśnādhikāra, (iv) Grahaṇādhikāra, (v) Chedyakādhikāra, (vi) Grahāstodayādhikāra, (vii) Śṛṅgonnatyadhikāra, (viii) Grahayutyadhikāra, (ix) Nakṣatrāstodayādhikara, (x) Mahāpātādhyāya, (xi) Viśvasthitijñānādhyāya. The work embodies elements of Greek (Alexandrian) astronomy (See. Thibaut, *Pañcasiddhāntikā*)

Manuscript reference:
ANUP. iv. p. 383, *68*, 16ff. *69*, 30ff.
BANARAS. p. 258, *8*, 4ff.
BERLIN. ii. part i, *1737*, 15ff. incomplete.
BODLEIAN. *796*, 174-212. 1761 A.D.
BORS/AB. iii. *309*, 16ff. Maithili.
BU/GD. i. *377*, 45ff. Nāgarī.
GUJARAT. iv. p. 188, *476*, 61ff.
NWP. v. p. 90, *4*, Nāgarī; p. 202, 5ff. Nāgarī.
PU. ii. *3870*, 4ff. Nāgarī.
RTL/MS. p. 171, 24ff.

Printed text, translations etc.
Romakasiddhānta, a part of the *Pañcasiddhāntikā*. Ed. with an original commentary in Sanskrit and an English translation and introduction by G. Thibaut and M.M. Sudhākara Dvivedin, Benares. 1889. Reprinted. Motilal Benarasidas, Lahore. 1930.

Study:
Das, Sukumar Ranjan. 'Alleged Greek influence on Hindu astronomy', *IHQ*, **4**, 68-77, 1928.
Pisharoti, K Rama. 'Śāstras—practical and theoretical', *QJMS*, **21**, No. 3, 206-231, 1931.
Winternitz, M. *Geschichte der indischen Litteratur*, **3**, 558, 559, Leipzig. 1922.

Romaśasiddhānta. see ROMAKASIDDHĀNTA

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RUDRADEVA s.o. Mahādeva.

Jyotiṣa-candrikā. ज्योतिषचन्द्रिका

An astronomical work.

Manuscript reference:

CP/HL. p. 173, *1865.*

Sābhra-nirabhra-vyākhyā. see VṚDDHA s.o. Jayadeva.

SADĀNANDA *alias* Vyāsa Sadānanda s.o. Vyāsāvataṅka Kīka.

Siddhānta-cintāmaṇi. सिद्धान्तचिन्तामणि

An astronomical work in three chs., first two dealing with the *gola* and the last with *gaṇita.*

Manuscript reference:

IO/AB. ii. part ii, *8052,* 21ff. Nāgarī. 1790 A.D.
IO/JE. v. *2903,* 10ff. Nāgarī. lacks the beginning.

Commentator:

Ambārama.

SADĀŚIVA,

Makaranda-sāriṇī. मकरन्दसारिणी

A set of astronomical tables based on Makaranda's work.

Manuscript reference:

NWP. i. p. 558, *152,* 45ff. Nāgarī.

SADĀŚIVA BHAṬṬA (c. 1598 A.D.)

Laghukaraṇa. लघुकरण 1598 A.D.

An astronomical work in 9 chs. *viz.*, (i) Madhyamādhikāra, (ii) Spaṣṭādhikāra, (iii) Lagnādhikāra, (iv) Candragrahaṇādhikāra, (v) Sūryagrahaṇādhikāra, (vi) Udayāstādhikāra, (vii) Grahayutyadhikāra, (viii) Śṛṅgonnatyadhikāra and (ix) Pātādhyāya.

Manuscript reference:

IO/JE. v. *2949,* 7ff. Nāgarī. 1700 A.D.

Sadratnamālā. see SAṄKARA VARMAN.

Ṣadyantra. see MAHENDRA SŪRI.

ŚĀKALYA, *alias* Śākapāṇi (c. 821 A.D.)

Brahmasiddhānta or *Śākalyasaṃhitā.* ब्रह्मसिद्धान्त, शाकल्यसंहिता

An astronomical work in 6 chs. of 764 verses. There are at present three *Brahmasiddhāntas* available, apart from the one (i.e. *Pitāmahasiddhānta*) referred to in the *Pañcasiddhāntikā* of

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Varāhamihira. They are the *Brahmasphuṭasiddhānta* of Brahmagupta, the *Brahmasiddhānta* of the *Viṣṇudharmottarapurāṇa* and the *Brahmasiddhānta* of *Śākalya* i.e., the present work. Each ch. of this work ends with *iti Śākalyasaṃhitāyāṃ dvitīyapraśne Brahmasiddhāntaḥ*, but nowhere in the original work, there is any mention of Śākalya (or Śākala, or Śākapāṇi), nor the other *praśnas* excepting the present one which forms the second *praśna*, have been noticed so far. Raṅganātha, while quoting from this work, uses at times the expression 'from Śākalya'. The number of revolutions of the planets and other elements in this work agree with those of the modern *Sūryasiddhānta*. According to Dīkṣita, this work cannot be earlier than 821 A.D. The six chs. of this work are (i) Kāla-nirūpaṇa, (ii) Grahāṇām ucca-nīca sthāna-kathana, (iii) Tithi-nakṣatrādinirūpaṇa, (iv) Grahodayāstādi-nirūpaṇa, (v) Graha-samāgamayuddhādi-nirūpaṇa and (vi) Chedyakādi-nirūpaṇa.

Manuscript reference:

AS/HS & PS. x. *6883*, 38ff. Nāgarī.
AS/KBK. p. 196. Bengali
BANARAS. p. 258, *65*, 36ff. 1879 A.D.
BERLIN. ii. part i, *1736*, 41ff. Nāgarī.
BN/AC. i, *245(IV)*, Bengali. 1840 A.D.; *304(I)*, Bengali. 1840 A.D.
BORS/AB. iii, *363*, 69ff. Nāgarī. 1898 A.D.; *363A*, 31ff. Maithili. 1838 A.D.
BU/GD. i. *367*, 32ff. Nāgarī; *368*, 47ff. Nāgarī; *369*, 16ff. Nāgarī. 1860 A.D.
CENSUS. *4785*, 8ff. German cursive script.
CSC/HS & SG. ix. *190*, 23ff. Nāgarī. 1898 A.D.
IO/JE. v. *2784*, 39ff. Nāgarī. 1792 A.D.; *2785*, 36ff. Nāgarī. 1798 A.D.; *2786*, 22ff. Nāgarī; *2787*, 23ff. Nāgarī. 1791 A.D. chs. 1-3 only.
MADRAS/D. xxiv. *13463*, 283ff. Nāgarī.
NOTICES/RM. iv. *1569*, 38ff. Nāgarī.
RAS/BB/HV. *248*, 19ff. Nāgarī; *249*, 17ff. Nāgari.
RORI/JM. ii. *5826*, 45ff. 19th century.
RTL/MS. p. 173. 25ff. Kashmiri.

Printed text, translations etc.

Brahmasiddhānta: Edited by Vindhyeśvarī Prasād Dvivedi. Benares Sanskrit series no. 152, 1912 A.D.

Study:

DAVIS, SAMUEL. 'On the astronomical computations of the Hindus', *AR*, **2**, 225-287, 1790.
DIKSHIT, SANKARA BALAKRISHNA. 'The twelve year cycle of Jupiter', *IA*, **17**, 1-7 & 312-17, 1888.

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Śākalyasaṃhitā. see ŚĀKALYA

ŚAMBHU s.o. Kamalanayana Śaṇḍa (c. 1659 A.D.).

Grahakauśala. ग्रहकौशल 1659 A.D.
An astronomical work in 9 chs. based on the *Sūryasiddhānta.*

Manuscript reference:
BU/HV. *1354*, 26ff. Nāgarī.

ŚAMBHUDĀSA.

Pañcaviṃśaṭīkā or *Gaṇita-pañcaviṃśaṭīkā.* पञ्चविंशटीका, गणितपञ्चविंशटीका
An elementary manual on astronomy.

Manuscript reference:
AS/HS & PS. x. *6878*, 3ff. Nāgarī. 1516 A.D.
GUJARAT. iv. p. 122, *50*, 10ff.

ŚAMBHUNĀTHA.

Gaṇitasāra. गणितसार

Manuscript reference:
GUJARAT. iv. p. 122, *52*, 8ff.

ŚAMBHU ŚARMAN.

Sūryasiddhānta-saṅgraha. सूर्यसिद्धान्तसङ्ग्रह
An astronomical work based on the *Sūryasiddhānta*

Manuscript reference:
MYSORE/AM. p. 51, *325*, 14ff. Grantha.

Saṃhitā-khaṇḍana-ratna. see ŚIVA ĀCĀRYA.

Samrāt Siddhānta. see JAGANNĀTHA.

Samrāt Yantra. see LAKṢMĪPATI.

ŚAṄKARA, s.o. Śukadeva Bhaṭṭa.

Karaṇa-vaiṣṇava or *Vaiṣṇava-karaṇa.* करणवैष्णव, वेष्णवकरण
An astronomical work on periods, called *karaṇas*. The work is illustrated elaborately with examples and problems.

Manuscript reference:
BANARAS. p. 264, *108*, 11 ff. 1879 A.D.
BIK/RM. *668*, 19 ff. Nāgarī.
CENSUS. *4781*, ff. 1-23, 28-51. Nāgarī.

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ŚAṄKARA (?)

Pañcabodha. पञ्चबोध

An astronomical work dealing with the computation of *tithi*, *vāra*, *nakṣatra*, *yoga* and *karaṇa*.

Manuscript reference:

TRI/KS. iii. *890A*, 34 ff. Malayalam.

ŚAṄKARA VARMAN.

Sadratnamālā. सद्रत्नमाला

A short treatise on mathematics in 5 chs. written at the direction of Rāmavarman, brother of Udayavarman, the king of Kerala. The work contains, among others, discussions on trigonometrical series.

Manuscript reference:

MADRAS/T. vol. v. part i. Sanskrit C, *4448*, 18 ff. Grantha. 1924-25 A.D.

Study:

FLEET, J. F. 'The Kaṭapayadi system of expressing numbers', *JRAS*, 788-94, 1911.

RAJAGOPAL, C. T. 'A neglected chapter of Hindu mathematics', *SM*, **15**, nos. 3-4, 201-9, 1949.

RAJAGOPAL, C. T. AND AIYAR, V. V. VEDAMURTHI. 'On the Hindu proof of Gregory's series', *SM*, **17**, nos. 1-2, 65-74, 1951.

RAJAGOPAL, C. T. AND VENKATARAMAN, A. 'The sine and cosine power series in Hindu mathematics (with an addendum by K. M. George)', *JASB*, 3rd series, **15**, 1-13, 1949.

SEAL, BRAJENDRANATH. 'Hindu and Greek contributions to mathematical sciences—A comparative retrospect', *JUPHS*, **8**, no. 1, 62-70. 1935.

WHISH, C. M. 'On the Hindu quadrature of the circle and the infinite series of the proportion of the circumference to the diameter exhibited in the four Śāstras, the *Tantrasaṃgraha*, *Yuktibhāṣā*, *Karaṇapaddhati* and *Sadratnamālā*', *TASGBI*, **8**, 509-23, 1835.

Saṅkrānti-prakaraṇa. see ŚIVA DAIVAJÑA s.o. Nāgeśa Daivajña.

Saṅkrānti-vākya. संक्रान्तिवाक्य

An anonymous work used in ascertaining the exact time of the passage of the sun from one *rāśi* to another.

Manuscript reference:

MADRAS/D. xxiv. *13504*, 6 ff. Telugu.

MADRAS/T. vol. iv. part i. Sanskrit C, *3943(d)*, ff. 43a-49a. Grantha.

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Saptarṣi-vicāra. see SĀRVABHAUMA.

Sāraṇī. सारणी

An anonymous work containing tables.

Manuscript reference:
LEIPZIG/TA. *984*, 58 ff. c. 1650 A.D.
NWP. i. p. 554, *140*, 8 ff. Nāgarī.

Sāraṇī-koṣṭhaka. see NĪLAKAṆṬHA JYOTIRVID.

Sāraṇī tathā koṣṭhaka. see DHANEŚVARA DAIVAJÑA.

Sārasaṃgraha. see MAHĀDEVA BHAṬṬA.

Sārasaṃgraha. see VYĀSAGAṆAPATI.

Sārasaṅgraha. see ŚRĪDHARA PAṆḌITA.

ŚĀRṄGADHARA.

Prajñāprakāśa. प्रज्ञाप्रकाश

An astronomical work.

Manuscript reference:
ZDMG/42. p. 549, *269*, 119 ff. incomplete.

Sāroddhāra. सारोद्धार

An anonymous astronomical work.

Manuscript reference:
BN/AC. i. *212* (*VIII*), Bengali. 18th century.

SĀRVABHAUMA.

Saptarṣi-vicāra. सप्तर्षिविचार

Manuscript reference:
BN/AC. i. *304* (*iv*). Bengali. 1840 A.D.

Sarvabodhinī-vyākhyā. see ŚRĪDHARA MAHĀPĀTRA.

Sarvagaṇita. सर्वगणित

An anonymous work.

Manuscript reference:
TRI/TG. vii. p. 87. Malayalam.

Sarvajyotiṣa-saṃgraha. सर्वज्योतिषसंग्रह

An anonymous astronomical work.

Manuscript reference:
MAC/HW. p. 164, *15*. Nāgarī.

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Sarvārtha-cintāmaṇi. see MALLĀRI s.o. Divākara.

Sarvārtha-cintāmaṇi. see VEṄKAṬEŚA.

Sarvasiddhāntarāja. see NITYĀNANDA s.o. Devadatta.

ŚATĀNANDA. (c. 1099 A.D.)

1. *Bhāsvatī* or *Bhāsvatīkaraṇa*. भास्वती, भास्वतीकरण 1099 A.D.

An astronomical treatise and a well-known karaṇa work, based largely on Varāhamihira's works and the *Sūryasiddhānta*. The occurrence of the eclipses can be determined accurately, according to the rules given in this work. Generally, in karaṇa works the epochal positions of the planets are given as true for Ujjain. Śatānanda, on the other hand, gives such epochal positions as true for Purī, the place of his residence. It contains the following 8 chs. *viz*, (i) Dhruvādhikāra, (ii) Bījādhikāra, (iii) Tithyadhikāra, (iv) Grahasādhanādhikāra, (v) Tripraśnādhikāra, (vi) Candragrahaṇādhikāra, (vii) Sūryagrahaṇādhikāra, and (viii) Parilekhādhikāra.

Manuscript reference:

ANUP. iv. p. 874, *527*, 10 ff.
AS/HS & PS. x. *6887*, 5 ff. Bengali. early 17th century; *6888*, 4 ff. Bengali. 19th century; *6889*, 15 ff. Nāgarī. 1827 A.D.
AS/KBK. p. 133. Bengali.
BANARAS. p. 261. *150*, ff. 1-9. 1603 A.D.; *161*, ff. 1-6.
BN/AC. i. *791* (*II*), Bengali. 19th century; *866* (*II*), Bengali. 19th century; *969* (*II*), Bengali. 1840 A.D.; *995* (*IV*), Bengali. 1840 A.D.
BORS/AB. iii. *236*, 7 ff. Maithili. 1800 A.D.; *236 A*, 10 ff. Maithili; 1849 A.D.; *236B*, 7 ff. Maithili. 1865 A.D.
BU/GD. i. *371*, 5 ff. Nāgarī.
CENSUS. *4782*, 10 ff. Nāgarī. 1822 A.D.
IO/AK. vol. 2. part i, *6307*, 3 ff. Nepalese. 19th century.
IO/JE. v. *2916*, 7 ff. Bengali; *2917*, 8 ff. Bengali.
NU/VK. *1400*, 14 ff. Nāgarī. *1401*, 12 ff. Nāgarī; *1402*, 19 ff. Nāgarī.
NWP. i. p. 546, *111*, 6 ff. Nāgarī; vii, p. 54, *10*, 32 ff. Nāgarī; ix. p. 49, *15*, 6 ff. Nāgarī.
OUDH. i. p. 116, *59*, 10 ff. Nāgarī; ix. p. 10. 1877.
PU. ii. *3740*, 12 ff. Nāgarī. 1768 A.D.
RAS/BB/HV. *251*, 6 ff. Nāgarī; *252*, 12 ff. Nāgarī.
RAS/BB/VM. p. l.
RORI/JM. ii. p. 104, *322*, 15 ff. 1902 A.D.
VSP. p. 163. *708*, ff. 1-7. Bengali. 1896 A.D.
VVRI/VB. *1131*, 13 ff. Nāgarī. 1836 A.D.; *2628*, 8 ff. Nāgarī.

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Commentators:

Acyuta Bhaṭṭa, Aniruddha, Balabhadra, Bhaṭṭotpala, Cakra Vipradāsa, Gaṇapati Bhaṭṭa, Gaṅgādhara, Gopāla, Gopīnātha Sudhī, Govinda Miśra, Kamalanayana, Keśava, Kubera Miśra, Mādhava, Madhusūdana, Rāmakṛṣṇa Bhaṭṭa, Rāmeśvara, Sadānanda, Vanamālī, Viśvanātha, Viśveśvaranātha, Vṛndāvana Śukla, Yogīndra.

Anonymous commentaries:

Bhāsvatīdyōta, Bhāsvatī-karaṇa-ṭīkā, Bhāsvatīṭīkā, Bhāsvatyudāharaṇa.

Printed texts, translations etc.

Bhāsvatī. Ed. Sudhākara Dvivedin. Banares. 1883.

Bhāsvatī. Ed. Haraprasāda Śāstrī. Chowkhamba Sanskrit series.

Bhāsvatī, with commentary *Bhāsvatī-vivaraṇa* by Mādhava Miśra. Benares. Siddhivinayaka Yantrasala. Sam. 1928 (1871 A.D.)

Bhāsvatī with a Sanskrit commentary entitled *Chātropabodhī* and a Hindi commentary with illustrations by Matriprasada Pandeya. Meharchand Laxman Das. Bombay.

Study:

BENTLEY, J. *Historical view of Hindu Astronomy*, 139-40, Calcutta, 1823.

2. *Tithyadhikāraṭīkā.* तिथ्यधिकारटीका

A commentary on the *Tithyadhikāra* of Kāśīśvara.

Manuscript reference:

CP/FK. p. 230, *57.*

Ṣaṭpañcāśikā. see KĀSĪ DĪKṢITA.

Saurabhāsya. see NṚSIṂHA s.o. Kṛṣṇa Daivajña.

Saurapakṣagaṇita. सौरपक्षगणित

An anonymous astronomical work.

Manuscript reference:

TANJORE/PPS. xvi. *11666*, 14 ff. Nāgarī.

Saurapakṣagaṇitavyākhyā. see VIŚVANĀTHA DAIVAJÑA S.O. Divākara Daivajña.

Saurapaurāṇika-mata-samarthana. see NĪLAKAṆṬHA S.O. Govinda Sūri.

Saurasāracandrakiraṇāvalī. see DĀDĀBHĀI S.O. Mādhava Gāṃkar.

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Saurasiddhāntikā. see VARĀHAMIHIRA's *Pañcasiddhāntikā.*

Saurasūtravivaraṇa. see DĀDĀBHĀI s.o. Mādhava Gāṃkar.

Sauravāsanā. see KAMALĀKARA s.o. Nṛsiṃha.

Sāyanatattva. see ḌHUṆḌHIRĀJA s.o. Nṛsiṃha.

Śeṣavāsanā. see KAMALĀKARA.

Siddhāntacintāmaṇi. see KEŚAVANĀTHA.

Siddhāntacintāmaṇi. see SADĀNANDA.

Siddhānta-cūḍāmaṇi. see RAṄGANĀTHA s.o. Nṛsiṃha Daivajña.

Siddhāntadarpaṇa. see CANDRAŚEKHARA.

Siddhāntadarpaṇa. see NĪLAKAṆṬHA SOMASUTVAN.

Siddhāntadarpaṇavyākhyā. सिद्धान्तदर्पणव्याख्या

An anonymous commentary on the *Siddhāntadarpaṇa* of Nīlakaṇṭha Somasutvan.

Manuscript reference:

TRI/KS. iv. *975*, 46 ff. Malayalam. incomplete.

Siddhāntādarśa. see AMBĀRAMA.

Siddhāntadīpikā. see PARAMEŚVARA.

Siddhāntagarbha. see MADANAPĀLA.

Siddhānta-jyotiṣa-sphuṭa-patrāṇi. सिद्धान्तज्योतिषस्फुटपत्राणि

An anonymous astronomical work.

Manuscript reference:

RORI/JM. ii. p. 118, *575*, ff. 14-39. 19th century.

Siddhānta-kaustubha. see SUNDAREŚVARA SŪRI.

Siddhānta-kaustubha.

An anonymous Sanskrit translation of the *Almagest.* It is suspected that this is probably another copy of Jagannātha's *Siddhāntasārakaustubha.*

Manuscript reference:

UJJAIN. p. 52. *59.*

Siddhāntalāghava. see GAṆEŚA DAIVAJÑA.

Siddhāntalaghukṣamaṇikā. see KEŚAVA DAIVAJÑA.

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Siddhāntamañjarī. see MATHURĀNĀTHA VIDYĀLAṄKĀRA

Siddhāntarahasya. see BĀLAMUKUNDA.

Siddhāntarahasya. see GAṆEŚA DAIVAJÑA s.o. Keśava Daivajña.

Siddhāṇtarahasya. see MALLĀRI s.o. Divākara.

Siddhāntarahasyodāharaṇa. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

Siddhāntarāja. see NITYĀNANDA s.o. Devadatta.

Siddhāntaratnāvalī. see RĀJACANDRA.

Siddhāntaratnāvalī. see RĀJANĀRĀYĀṆA.

Siddhāntasāra. see VIṢṆU SIṂHA.

Siddhānta-sāra. सिद्धान्तसार

An anonymous astronomical work.

Manuscript reference:

M & C/LR. *342*, Kanarese.

Siddhāntasārakaustubha. see JAGANNĀTHA.

Siddhāntasārvabhauma. see MUNĪŚVARA.

Siddhāntasaudhavyākhyā. see VIṢṆUDEVA.

Siddhāntaśekhara. see ŚRĪPATI s.o. Nāgadeva.

Siddhāntaśekhara-vyākhyā. सिद्धान्तशेखरव्याख्या

An anonymous commentary on the *Siddhānta-śekhara* of Śrīpati

Manuscript reference:

MADRAS/T. vol. vi. part i. Sanskrit, *5175*, 38 ff. Grantha. 1925-26 A.D. incomplete.

Siddhāntasindhu. see NITYĀNANDA s.o. Devadatta.

Siddhāntaśiromaṇi. see BHĀSKARĀCĀRYA.

Siddhantaśiromaṇibhāsya. see DHANEŚVARA.

Siddhāntaśiromaṇibhāsya. see MAHEŚVAROPĀDHYĀYA.

SIDDHĀNTA ŚIROMAṆI BHAṬṬĀCĀRYA.

Siddhāntaśiromaṇi. सिद्धान्तशिरोमणि

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Manuscript reference:
M & C/LR. *341*. Nāgarī.

Siddhānta-śiromaṇi-marīci. see RAṄGANĀTHA.

Siddhānta-śiromaṇiṭīkā. see BHĀSKARĀCĀRYA.

Siddhāntaśiromaṇiṭīkā. see. CAKRACŪḌĀMAṆI.

Siddhāntaśiromaṇiṭīkā. see VĀCASPATI MIŚRA.

Siddhāntaśiromaṇiṭīkā. सिद्धान्तशिरोमणिटीका
An anonymous commentary on the *Siddhānta-śiromaṇi* of Bhāskarācārya.
Manuscript reference:
NU/VK. *2474*, 160 ff. Nāgarī.

Siddhāntaśiromaṇivāsanā. see MOHANADĀSA.

Siddhāntaśiromaṇivāsanāvārtika. see NṚSIṂHA s.o. Kṛṣṇa Daivajña.

Siddhāntaśiromaṇivyākhyā. see GAṆEŚA DAIVĀJÑA s.o. Keśava Daivajña.

Siddhāntaśiromaṇivyākhyā. see HARIHARA s.o. Āśādhara.

Siddhānta-śiromaṇi-vyākhyā. सिद्धान्तशिरोमणिव्याख्या
An anonymous commentary on the *Siddhānta-śiromaṇi* of Bhāskarācārya.
Manuscript reference:
TANJORE/PPS. xvi. *11655*, 52 ff. Nāgarī.

Siddhānta-śiromaṇyudāharaṇa. सिद्धान्तशिरोमण्युदाहरण
An anonymous commentary on the *Siddhānta-śiromaṇi* of Bhāskarācārya.
Manuscript reference:
PU. ii. *4059*, 72 ff. Nāgarī. 1878 A.D.

Siddhānta-sudhā. see PARAMĀNANDA ṬHAKKURA.

Siddhāntasundara. see JÑĀNARĀJA s.o. Nāganātha.

Siddhāntasundaravyākhyā. see CINTĀMAṆI s.o. Jñānarāja.

Siddhānta-tattva. see KAMALĀKARA s.o. Nṛsiṃha.

Siddhānta-tattva. see TRIVIKRAMĀCĀRYA.

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Siddhānta-tattvaṭīkā. see SUDHĀKARA DVIVEDIN.

Siddhānta-tattvaviveka. see KAMALĀKARA S.O. Nṛsiṃha.

Siddhāntoka-huḍī-vicāra. सिद्धान्तोकहुडीविचार
An anonymous work.

Manuscript reference:
RAS/BB/VM. p. xxix. ff. 2-16.

SIDDHA SŪRI of Upakeśapurī.

Bṛhat-kṣetrasamāsa-vṛtti. बृहत्क्षेत्रसमासवृत्ति
A commentary on the *Kṣetrasamāsa* of Jinabhadra Gaṇi.

Manuscript reference:
GOS/21. p. 35, *235.*
GOS/76. *25* (*l*) 64 ff. *44*, 286 ff. 1217 A.D.

Śīghra-karaṇa-paḍakāni. शीघ्रकरणपदकानि
An anonymous Karaṇa work.

Manuscript reference:
MYSORE/AM. p. 51, *212*, ff. 61-62. Nāgarī.

Śīghra-siddhi. see LAKṢMĪDHARA S.O. Vaijadeva.

SĪHORA.

Bhūbhramavāda-khaṇḍana-nirāsa. भूभ्रमवादखण्डननिरास
An astronomical work.

Manuscript reference:
CP/FK. p. 236, *104*, 17 ff. 1838 A.D.

SIṂHATILAKA SŪRI, disciple of Vibudhacandra Sūri. (c. 1269 A.D.)

Bhuvanadīpaka-ṭīkā or *Bhuvanadīpaka-vṛtti* or *Bhuvanadīpikāvicāra.* भुवनदीपकटीका, भुवनदीपकवृत्ति, भुवनदीपिकाविचार 1269 A.D.

A commentary on the *Bhuvanadīpaka* of Padmanābha. There seems to be another work by the author entitled *Gaṇitatilaka-vṛtti*, probably a commentary on the *Gaṇitatilaka* of Śrīpati (cf. GOS/21. p. 66).

Manuscript reference:
RAS/BB/VM. p. li. 37 ff. 29 ff.
RORI/JM. ii. *4411*, 53 ff. 19th century.
VSP. *1422*, ff. 1-23, Nāgarī. 1401 A.D.

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Śiromaṇiṭīkā. see JAYALAKṢMAṆA.

Śiromaṇyudāharaṇa. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

Śiṣyadhīvṛddhida. see LALLA s.o. Bhaṭṭa Ṭrivikramaṃa.

ŚIVA.

Akṣaracintāmaṇi. अक्षरचिन्तामणि

Manuscript reference:
GUJARAT. iv. p. 114, *1*, 8 ff. 1661 A.D.

ŚIVA.

Vīramitrodaya-vyākhyā. वीरमित्रोदयव्याख्या
A commentary on the *Vīramitrodaya* of Rāma Daivajña.

Manuscript reference:
AS/HS & PS. x. *6928*, 54 ff. Nāgarī. 19th century.

ŚIVA ĀCĀRYA.

Saṃhitā-khaṇḍanaratna. संहिताखण्डनरत्न

Manuscript reference:
OUDH (1890). p. 120, 58 ff. Nāgarī.

ŚIVA DAIVAJÑA

Grahaprabodha. ग्रहप्रबोध

Manuscript reference:
CP/HL. p. 144, *1536*; *1537*; *1538*.

Commentator:
Nāgeśa Daivajña.

ŚIVA DAIVAJÑA s.o. Nāgeśa Daivajña.

Saṃkrānti-prakaraṇa. संक्रान्तिप्रकरण
A portion of this work deals with the passage of the sun from one sign of the zodiac to another.

Manuscript reference:
BIK/RM. *723*, 15 ff. Nāgarī.
CENSUS. *4786*, 19 ff. Nāgarī.

ŚIVADĀSA s.o. Nārada.

Mānavaśulbabhāṣya. मानवशुल्वभाष्य
A commentary on the *Mānava-śulbasūtra* of Manu.

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Manuscript reference:
AS/HS. p. 460, *492*, 32 ff. Nāgarī. 17th century.

SMARA SIṂHA.

Karmaprakāśinī-vṛtti. कर्मप्रकाशिनीवृत्ति
A commentary on anonymous *Karmaprakāśinī*.
Manuscript reference:
GUJARAT. iv. p. 116, *20*.

Ṣoḍaśa-yogavyākhyāna. see LAKṢMĪPATI

Ṣoḍaśayogīṭīkā. see RĀMADATTA

SOMA BHAṬṬA.

Bṛhatkalpalatā. बृहत्कल्पलता
Manuscript reference:
GUJARAT. iv. p. 166, *291*, 20 ff.

SOMA DAIVAJÑA s.o. Rudrabhaṭṭa. (c. 1642 A.D.)

Kalpalatā. कल्पलता 1642 A.D.
A treatise helpful for the preparation of calendar.
Manuscript reference:
CP/HL. p. 68, *724*, *725*, *726*.
Printed text, translations etc.
Kalpalatā. Banares Sanskrit Press. 1869 A.D.

SOMĀKARA *alias* Śeṣa *alias* Śeṣanāga.

Jyotiṣa-bhāsya or *Jyotiśśāstra-bhāsya.* ज्योतिषभाष्य. ज्योतिश्शास्त्रभाष्य
A commentary on the three (*Ṛk*, *Yajus* and *Atharvan*) recensions of the *Vedāṅgajyotiṣa*, attributed to Lagadha.
Manuscript reference:
(a) *Ṛk recension:*
TCC/TA. p. 321, 61 ff. Nāgarī. 1806 A.D.
(b) *Yajus-recension:*
BERLIN. ii. part i. *1505*, 78 ff.
JRAS/1902, *78* (MM 77 B-8). 78 ff. Nāgarī.
(c) *Manuscript of which recension is not known:*
ANUP. p. 358, *277*, 20 ff.
AS/HS & PS. x. *6929*, 26 ff. Nāgarī. 1826 A.D.
CP/FK. p. 3, *29*, 17 ff. 18th century.
GUJARAT. i. p. 202, *31*, 30 ff.; iv. p. 140, *144*, 21 ff.

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NWP. vi. p. 62, *3*, 10 ff. Nāgarī.
RORI/JM. ii. *5721*, 32 ff. 1875 A.D.
TCC/TA. p. 31. 19 ff. Nāgarī. 1803 A.D.

Printed text, translations etc.
Yājuṣa Jyotiṣa with the *Bhāṣya* of Somākara and Sudhākara Dvivedin and *Ārca Jyotiṣa* with the *Bhāṣya* of Sudhākara Dvivedin and Muralīdhara Jhā's explanatory notes. Edited by Sudhākara Dvivedin. *Paṇḍit*, New Series. vol. xxix. 1876-1920. Reprint, 2nd edition. Bombay. 1908.

SOMANĀTHA.
Jñānamañjarī. ज्ञानमञ्जरी

Manuscript reference:
CP/HL. p. 171, *18115*.
GUJARAT. iv. p. 138, *133*, 5 ff.

Somasiddhānta. सोमसिद्धान्त

An astronomical treatise following the *Sūryasiddhānta*. in 10 chs., *viz.*, (i) Golādhyāya, (ii) Spaṣṭādhikāra, (iii) Tripraśnādhikāra, (iv) Candrārkayoḥ grahaṇānayanādhyāya. (v) Parilekhanādhyāya, (vi) Nakṣatragrahayogasamāgamādhyāya, (vii) Grahodayāstamānādhikāra, (viii) Śṛṅgonnatyadhyāya, (ix) Pātādhyāya and (x) Golādhyāya.

Manuscript reference:
BANARAS. p. 257, *171*, 15 ff.
BERLIN. i, *840*, 13 ff. 1789 A.D.
BORS/AB. iii. *425*, 11 ff. Maithili. 1787 A.D.
BU/GD. i. *394*, 19 ff. Nāgarī. 1799 A.D.; *395*, 12 ff. Nāgarī; *396*, 8 ff. Nāgarī.
IO/JE. v. *2998*, 50 ff. Bengali.
M & C/LR. *349*, Nāgarī.
MADRAS/D. xxiv. *13515*.
NOTICES/RM. v. *1904*, 14 ff. Nāgarī. 1800 A.D.
RTL/MS. p. 177. 17 ff.
TANJORE/PPS. xvi. *11665*, 12 ff. Nāgarī.
TCC/TA. p. 30, 10 ff. Bengali. 17th century.

Commentators:
Māmiḍi Śiṅgaya & Viśvanātha.

Printed text, translations etc.
Somasiddhānta. Ed. by Vindhyeśvarīprasād Dvivedi, Fascicle i. Benares Sanskrit Series No. 152, Benares 1912; for detail, see *Jautiṣasiddhāntasaṃgraha*.

Study:
Das, Sukumar Ranjan. 'Precession and Libration of the Equinoxes in Hindu astronomy', *JASB*, ns. **23**, no. 3. 403-13, 1927.

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Somasiddhāntaṭīkā. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

SOMATILAKA SŪRI.

Kṣetrasamāsa. क्षेत्रसमास

Manuscript reference:

RORI/JM. ii. 32 ff. 16th century, one copy.

SOMEŚVARA.

1. *Vāsanābhāsya.* वासनाभाष्य

A commentary on the *Āryabhaṭīya* of Āryabhaṭa I.

Manuscript reference:

BU/GD. i. *335*, 35 ff. Nāgarī. 1863 A.D.

2. *Vāsanābhāsya.* वासनाभाष्य

A commentary on the *Mahāsiddhānta* of Āryabhaṭa II.

Manuscript reference:

BU/GD. i. *329*, 50 ff. Nāgarī.

Spaṣṭādhikāra-sāriṇī. स्पष्टाधिकारसारिणी

Anonymous astronomical tables.

Manuscript reference:

VVRI/VB. *4745*, 12 ff. Nāgarī.

Sphuṭanirṇayayantra. स्फुटनिर्णययन्त्र

An anonymous compendium of astronomical calculations in 6 chs. *viz.*, (i) Bhasaṃkhyā kathana, (ii) Madhyamānayana, (iii) Mandasphuṭānayana, (iv), (v) & (vi) Bhūgosphuṭānayana.

Manuscript reference:

MADRAS/T. vol. iv. part i. Sanskrit C. *3799* (*b*). ff. 13a-29b. Nāgarī & Grantha. 1921-22 A.D.

Anonymous commentary:

Sphuṭanirṇayayantra-vivṛti.

Sphuṭanirṇayayantra-vivṛti. स्फुटनिर्णययन्त्रविवृति

An anonymous commentary on the *Sphuṭanirṇayayantra.* This commentary refers to Garga, Lalla, Śrīpati, Muñjāla, Govinda, Parameśvara, Mādhava and their works.

Manuscript reference:

MADRAS/T. vol. iv. part i. Sanskrit C. *3799* (*b*). ff. 13a-29b. Nāgarī & Grantha. 1921-22 A.D.

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ŚRĪCANDRA SŪRI.
Kṣetrasamāsaprakaraṇa: क्षेत्रसमासप्रकरण
Manuscript reference:
GOS/135. *109* (1), 62 ff.

ŚRĪDATTA.
Khaṇḍakhādyaṭīkā. खण्डखाद्यटीका
A commentary on the *Khaṇḍakhādya* of Brahmagupta.
Manuscript reference:
NEPAL/HS. i. p. 102, *1648*, 136 ff. Newārī.

ŚRĪDHARĀCĀRYA. (c. 991 A.D.)
1. *Gaṇitasāra* or *Triśatīgaṇitasāra* or *Triśatikā* or *Pāṭīsāra* or *Pāṭīgaṇita* or *Pāṭīgaṇitasāra* or *Śrīdharapāṭī* or *Śrīdharīlīlāvatī*. गणितसार, त्रिशतीगणितसार, त्रिशतिका, पाटीसार, पाटीगणित, पाटीगणितसार, श्रीधरपाटी श्रीधरीलीलावती
A compendium of arithmetic.
Manuscript reference:
BANARAS. p. 256, *88*, 18 ff.
BM/CB. *445*, 10 ff. 1608 A.D.
GUJARAT. iv. p. 148. *192*, 11 ff.; p. 154, *228*, 22 ff.; p. 172, *53*, 16 ff.; p. 198, *470*, 9 ff. 1552 A.D.; *471*, 59 ff.
IO/AK. ii. part i, *6317*, 64 ff. Nāgarī. 18th century.
IO/JE. v. *2788*, 23 ff. Nāgarī; *2789*, 23 ff. Nāgarī. 1605 A.D.; *2790*, 15 ff. Nāgarī.
KANNADA. *781*, 45 ff. Kanarese.
NWP. x. p. 50, *29*.
TRI/TG. i. *145*, Malayalam.
VSP. p. 259, *1426*, 26 ff. Nāgarī; p. 261, *1425*, 41 ff. Nāgarī.
ZDMG/33. p. 693.
Printed text, translations etc.
Triśatī. Ed. by Sudhākara Dvivedin, Nirnayasagar Press, 1899.
Pāṭīgaṇita. Edited and translated into English by Kripa Sankar Shukla, Lucknow University.
Study:
CHAKRABARTY, GURUGOVINDA. 'Surd in Hindu Mathematics,' *JDL/CU*, **24,** 29-58, 1934.
CHAKRABARTY, GURUGOVINDA. 'Typical problems of Hindu Mathematics', *ABORI*, **14,** 87-102, 1933.
CHAKRABARTY, GURUGOVINDA. 'The growth and development of progressive series in India', *JDL/CU*, **24,** 1-18, 1934.
RĀMĀNUJĀCĀRYA, N. 'The *Triśatikā* of Śrīdharācārya', *BM*, **13,** 203-217, Leipzig, 1913.
SARASVATI, T. A. 'Śreḍhīkṣetras or diagrammatical representation of Mathematical Series,' *JORM*, **28,** no. 1-4, 74-85, 1961.

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SHUKLA, KRIPASHANKAR. 'On Śrīdhara's rational solution of: $Nx^2+1=y^2$,' *GANITA*, **1,** no. 2. 1-12, 1950.
SINGH, AVADESH NARAYAN. 'On the Indian method of root extraction', *BCMS*, **18,** 123-40, 1927.
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2. *Pāṭīgaṇitaṭīkā.* पाटीगणितटीका
A commentary on the *Līlāvatī* of Bhāskarācārya.
Manuscript reference:
MAC/HW. p. 169, *54.* Nāgarī.
RTL/MS. p. 165. 157 ff. incomplete.

ŚRĪDHARĀCĀRYA. (c. 1227 A.D.)
Laghukhecarasiddhi. लघुखेचरसिद्धि 1227 A.D.
A treatise on planetary motions in 20 verses with a set of astronomical tables entitled *Grahasāriṇī.*
Manuscript reference:
IO/JE. v. *2930*, 9 ff. Nāgarī. 1555 A.D.

Śrīdharīlīlāvatī. see ŚRĪDHARĀCĀRYA.

ŚRĪDHARA MAHĀPĀTRA s.o. Nimma. (c. 1717 A.D.)
Sarvabodhinī-vyākhyā. सर्वबोधिनीव्याख्या 1717 A.D.
A commentary on the *Līlāvatī* of Bhāskarācārya.
Manuscript reference:
IO/AK. ii. part i, *6318*, 207 ff. Nāgarī. 18th century.
MADRAS/T. vol. iv. part i, Sanskrit, *5244*, 148 ff. Nāgarī. 1926-27 A.D.

ŚRĪDHARA PAṆḌITA.
Sārasaṅgraha. सारसङ्ग्रह
Manuscript reference:
RAS/BB/VM. p. xxix. 25 ff.

Śrīdharapāṭī. see ŚRĪDHARĀCĀRYA.

ŚRĪKAṆṬHA, disciple of Rudra.
Sūryasiddhānta-vyākhyā. सूर्यसिद्धान्तव्याख्या
A commentary on the *Sūryasiddhānta.* At the beginning of this

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work the author states that he wrote the same after completing the commentaries on the *Laghubhāskarīya*, the *Mahābhāskarīya*, the *Līlāvatī*, the *Grahagaṇita* etc.

Manuscript reference:
MADRAS/T. vol. iv. part i, Sanskrit C, *3730*, 68 ff. Nāgarī. 1921-22 A.D.

Śrīkaraṇa. श्रीकरण

An anonymous *karaṇa*-work in 12 chs. *viz.*, (i) Dhruvakānayana, (ii) Tithinakṣatrādhikāra, (iii) Tripraśnādhikāra, (iv) Bhaumasya Khaṇḍa, (v) Budhasya Khaṇḍa, (vi) Jīvasya Khaṇḍa, (vii) Saurasya Khaṇḍa, (viii) Sphuṭagatyadhikārā, (ix) Somagrahaṇa, (x) Ādityagrahaṇa, (xi) Samāgamādhikāra and (xii) Śṛṅgonnatyadhikāra.

Manuscript reference:
BM/CB. *468*, ff. 7-34. Nepalese. 1320 A.D.

ŚRĪKṚṢṆA

Līlāvatī-ṭikā. लीलावतीटीका

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:
NWP. i. p. 518, *38*, 44 ff. Nāgarī; ii. p. 74, *2*, 56 ff. Bengali.

ŚRĪNĀTHA PAṆḌITA

Parahita-saṃhitā. परहितसंहिता

Manuscript reference:
MADRAS/T. xi. *7621*, 156 ff. Nāgarī.

ŚRĪNIVĀSA

Karaṇaprakāśavyākhyā or *Prabhā.* करणप्रकाशव्याख्या, प्रभा

A commentary on the *Karaṇaprakāśa* of Brahmadeva Gaṇaka.

Manuscript reference:
IO/JE. v. *2914*, 65 ff. 1755 A.D.
RAS/BB/HV. *224*, 24 ff.

ŚRĪPATI

Tattvapradīpa or *Tattvapañcāśikā* or *Padyapañcāśikā.* तत्त्वप्रदीप, तत्त्वपञ्चाशिका, पद्यपञ्चाशिका

Manuscript reference:
CP/FK. p. 228, *49*, 5 ff. 1807 A.D.
GUJARAT. iv. p. 152, *217*, 4 ff.
PU. ii. *3485*, 17 ff. Nāgarī. 1680 A.D.; *3486*, 6 ff. Nāgarī; *3487*, 5 ff. 1845 A.D.

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ŚRĪPATI.

Tithipatra-nīrājanāvalī. तिथिपत्रनीराजनावली

Manuscript reference:

OUDH. v. p. 12, *5*, 186 ff. Nāgarī.

ŚRĪPATI s.o. Nāgadeva and grandson of Bhaṭṭa Keśava. (999 A.D.)

1. *Dhīkoṭī* or *Dhīkoṭīkaraṇa* or *Dhīkoṭīgrahakaraṇa.* धीकोटी, धीकोटीकरण, धीकोटीग्रहकरण 1039 A.D.

A *Karaṇa* work which follows the *Āryabhaṭīya* of Āryabhaṭa I with the corrections made according to Lalla. It has adopted Śaka 961 as its epochal year.

Manuscript reference:

GUJARAT. iv. p. 150, *200*, 4 ff.; 201.
NWP. ix. p. 52, *42.*
RAS/BB/HV. *244*, 5 ff. Nāgarī.
VVRI/VB. *2454*, 4 ff. Nāgarī. 1793 A.D.; *2596*, 4 ff. Nāgarī. 1730 A.D.; *2646*, 7 ff. Nāgarī. 1793 A.D.

Commentator:

Harikṛṣṇa.

Anonymous commentaries:

Dhīkoṭīṭīkā and *Udāharaṇa.*

2. *Dhruvamānasa.* ध्रुवमानस 1056 A.D.

An astronomical work, based on the *Laghumānasa* of Mañjula.

Manuscript reference:

GUJARAT. iv. p. 150, *202*, 7 ff.

3. *Gaṇitatilaka.* गणिततिलक

A work on Mathematics.

Printed text, translations etc.

Gaṇitatilaka with the commentary of Simhatilaka Sūri. Critically edited with introduction and appendices by H. R. Kapadia, M. A., Gaekwad's Oriental Series. No. 78. Baroda 1937.

4. *Siddhāntaśekhara.* सिद्धान्तशेखर 1039 A.D.

A *Siddhānta*-work on astronomy in 20 chs. *viz.*, (i) Grahabhaganādhyāya, (ii) Madhyamādhyāya, (iii) Spaṣṭādhyāya, (iv) Tripraśnādhyāya, (v) Candragrahaṇādhyāya, (vi) Sūryagrahaṇādhyāya, (vii) Parvasambhavādhyāya, (viii) Pātādhyāya, (ix) Udayāstādhyāya, (x) Candrādhyāya, (xi) Grahayutyadhyāya, (xii) Bhagrahayogādhyāya, (xiii) Vyaktagaṇitādhyāya, (xiv) Avyaktagaṇitādhyāya, (xv) Golavāsanādhyāya,

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(xvi) Golavarṇanādhyāya, (xvii) Rāhunirākaraṇādhyāya, (xviii) Grahopapattivarṇanādhyāya, (xix) Yantrādhyāya, (xx) Praśnādhyāya.

Manuscript reference:
ANUP. v. p. 401, *920*, 86 ff.
IO/AK. ii. part i., *6290*, 55 ff. Malayalam. 1800 A.D.
MADRAS/D. xxiv, *13506*, 126 ff. Nāgarī.
MADRAS/T. vol. v. part i. Sanskrit B, *4391*, 170 ff. Grantha.
RAS/MW. *122* (1), 40 ff. Malayalam.
TRI/TG. i. *179*, Malayalam.

Commentator.
Makkibhaṭṭa.

Anonymous Commentary.
Siddhāntaśekhara-vyākhyā

Printed text, translations etc.
The *Siddhāntaśekhara* of Śrīpati, part I, chs. I-IV. Ed. with commentary by Makkibhaṭṭa; chs. V-XII by Bābuāji Miśra. Calcutta University. 1936. Part II. chs. xiii-xx. Ed. with an original commentary by Bābuāji Miśra and with an introduction by Prabodh Ch. Sengupta and Nirmal Ch. Lahiri. Calcutta University. 1947.

Study:
SENGUPTA, P. C. 'Hindu Luni-solar Astronomy', *BCMS*, **24**, 1-18, 1932.

ŚRĪPATI BHAṬṬA.
Makaranda-vivaraṇa. मकरन्दविवरण
A commentary on the *Tithipatra* of Makaranda.

Manuscript reference:
RORI/JM. ii. *7515*, 12 ff. 1936 A.D.

ŚRĪRĀJĀDITYA.
Gaṇitaśāstra. गणितशास्त्र
An astronomical treatise.

Manuscript reference:
TAYLOR. p. 328, *1657*, 25 ff. Kanarese.

Subodhacandrodayakaraṇa. see PARAMĀNANDA.

Subodhikā. see KṢEMAṄKARA.

Subodhinī. see MADHUSŪDANA s.o. Murāri Śukla.

Subodhinī. see VIṢṆU DAIVAJÑA s.o. Divākara Daivajña.

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Subodhīnīṭīkā. see NĪLAKAṆṬHA JYOTIRVID S.O. Ananta.

SUDHĀKARA DVIVEDIN. (c. 1892).

1. *Bhābhrama-rekhā-nirūpaṇa.* भाभ्रमरेखानिरूपण

An astronomical work.

Manuscript reference:

BORS/AB. iii. *226*, 4 ff. Nāgarī. 1919 A.D.

2. *Bhū-bhramaṇa.* भूभ्रमण

An astronomical work containing two views regarding the rotation of the earth.

Manuscript reference:

BORS/AB. iii. *202*, 2 ff. Maithili.

3. *Bījagaṇitamavyaktagaṇitaṃ vā.* बीजगणितमव्यक्तगणितं वा

The work embodies Bhāskarācārya's *Bījagaṇita*, with his expository notes. Edited with further notes by Muralidhar Jhā. Benares Sanskrit Series, 1927.

4. *Brāhmasphuṭasiddhāntaṭīkā.* ब्राह्मस्फुटसिद्धान्तटीका

A commentary on the *Brāhmasphuṭasiddhānta* of Brahmagupta, *PANDIT*, ns., **23-24,** 1901-2.

5. *Calarāśikalana.* चलराशिकलन

A work in 15 chapters. The first four chapters are grouped under Part I and the remaining ones in Part II. Part I deals with rational fractions and miscellaneous remarks; Part II is devoted to reduction formula, double integration, lengths of curves, areas of plane curves, area of surfaces, volumes of solids, definite integrals, and similar problems. The author has also introduced many new methods and differential calculus.

Printed text, translations etc.

Calarāśikalana. Ed. by Baladeva Misra. Benares Government Sanskrit Library. 2 Volumes. Princes of Wales Saraswati Bhavan Texts, No. 80, 1941-43.

6. *Dīrghavṛttalakṣaṇa.* दीर्घवृत्तलक्षण

A treatise on the properties of ellipse.

Printed text, translations etc.

Dīrghavṛttalakṣaṇa. Second edition, 1943.

7. *Gaṇaka-taraṅginī.* गणकतरङ्गिणी 1892 A.D.

A work on the lives and works of Hindu astronomers and mathematicians.

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Printed text, translations etc.

Gaṇakataraṅgiṇī. Originally published in the *PANDIT*. Reprinted. Benares. 1892.

8. *Grahalāghavakaraṇa*. ग्रहलाघवकरण

A commentary on the *Grahalāghava* of Gaṇeśa Daivajña.

Printed text, translations etc.

Grahalāghavakaraṇa. With commentaries of Mallāri, Viśvanātha and author's own commentary. Banares. 1904.

9. *Karaṇaprakāśaṭīkā*. करणप्रकाशटीका

A commentary on the *Karaṇaprakāśa* of Brahmadeva Gaṇaka.

Printed text, translations etc.

Karaṇaprakāśaṭīkā. Ed. with a commentary and theory of numbers by Sudhākara Dvivedin. 1899.

10. *Mahāsiddhāntaṭīka*. महासिद्धान्तटीका

A commentary on the *Mahāsiddhānta* of Āryabhaṭa II.

Printed text, translations etc.

Mahāsiddhāntaṭīkā. Benares Sanskrit Series No. 36, Benares, 1910.

11. *Pañcasiddhāntikāṭīkā* or *Pañcasiddhāntikāprakāśikā*. पञ्चसिद्धान्तिकाटीका, पञ्चसिद्धान्तिकाप्रकाशिका

A commentary on Varāhamihira's *Pañcasiddhāntikā*.

Printed text, translations etc.

Pañcasiddhāntikāṭīkā. With Varāhamihira's *Pañcasiddhāntikā*, an English translation and introduction by G. Thibaut. Benares. 1889. Reprinted. Motilal Banarsi Dass. 1930.

12. *Siddhāntatattvavivekaṭīkā*. सिद्धान्ततत्त्वविवेकटीका

A commentary on the *Siddhāntatattvaviveka* of Kamalākara Bhaṭṭa.

Printed text, translations etc.

Siddhāntatattvavivekaṭīkā. Benares, 1885.

13. *Sudhāvarṣiṇī* or *Sūryasiddhāntaṭīkā*. सुधावर्षिणी. सूर्यसिद्धान्तटीका

A commentary on the *Sūryasiddhānta*.

Printed text, translations etc.

Sūryasiddhāntaṭīkā. Ed. with commentary called *Sudhāvarṣiṇī* 1909; 2nd edition, 1925.

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14. *Vāstavacandra-śṛṅgonnatisādhana.* वास्तवचन्द्रशृङ्गोन्नतिसाधन

A treatise on astronomy.

Printed text, translations etc.

The text, edited by Gaṅgādhara Miśra. Benares, 1943.

15. Commentaries on *Yājuṣa-Jyautiṣa* and *Ārca-Jyautiṣa.*

Printed text, translations etc.

Yājuṣa-Jyautiṣam Somākara-Sudhākara Bhāṣya sahitam; Ārca-Jyautiṣam Sudhākara Bhāṣyeṇa etc. Benares. 1908.

Sudhāvarṣiṇi. see SUDHĀKARA DVIVEDIN

Sudhīrañjanayantra. see GAṆEŚA DAIVAJÑA s.o. Keśava Daivajña.

Śulbadīpikā. see DVĀRAKĀNĀTHA.

Śulbamīmāṃsā. see VYAṄKAṬEŚVARA.

Sumatamahātantra. सुमतमहातन्त्र

Manuscript reference:

BM/CB. *467*, 123 ff. Nepalese. 1356 A.D.

SUNDARARĀJA.

Āpastamba-savyākhyā. आपस्तम्बसव्याख्या

A commentary on the *Śulbasūtra* of Āpastamba.

Manuscript reference:

AS/HS. p 490, *553*, 53 ff. Nāgarī. complete; p. 491, *554*, 33 ff. Nāgarī. 17th century.

PU. i. p. 40, *98*, 10 ff.

TANJORE/AB. p. 16, *102*, 65 ff.

VVRI/VB. p. 74, *13*, 27 ff. Nāgarī.

SUNDARARĀJA.

Grahadīpikā. ग्रहदीपिका

An astronomical work in 8 chs.

Manuscript reference:

PU. ii. *3346*, 138 ff. Tamil.

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SUNDARARĀJA s.o. Anantanārāyaṇa.

Vākyakaraṇadīpikā or *Laghuprakāśikā* or *Laghudīpikā*. वाक्यकरणदीपिका, लघुप्रकाशिका, लघुदीपिका

A commentary on the *Vākyakaraṇa*, an anonymous work.

Manuscript reference:

MADRAS/D. xxiv. *13497*, 152 ff. Nāgarī; *13498*, 84 ff. Nāgarī.
MADRAS/T. vol. iv. part i. Sanskrit C, *3877* (*k*), ff. 109a-137b. Grantha. incomplete; *3954* (*a*), ff. 8a-43b. Grantha.
RAS/MW. *68* (1), 73 ff. Grantha.

Sundara-siddhāntabīja. see JÑĀNARĀJA s.o. Nāgaṇātha.

SUNDARA SŪRI.

Āpastamba-śulbaśūtrabhāṣya. आपस्तम्बशुल्वसूत्रभाष्य

A commentary on the *Śulbasūtra* of Āpastamba.

Manuscript reference:

PU. i. p. 40, *97*, ff. 33+7.

SUNDAREŚVARA SŪRI. (19th century.)

Siddhāntakaustubha. सिद्धान्तकौस्तुभ c. 1893 A.D.

An astronomical work, along with solar tables.

Manuscript reference:

CSC/HS & SG. ix. *162*, 72 ff. Nāgarī. *163*, 12 ff. Nāgarī.

Sundarī. see UDĀYADIVĀKARA.

SŪNṚTAVĀDIN

Jyotiṣasaṃhitārṇava. ज्योतिषसंहितार्णव

An astronomical work.

Manuscript reference:

HULTZSCH. i. *143*, 92 ff. Telugu.

SŪRAJI

Gaṇitāmṛtasāgarī. गणितामृतसागरी

A treatise on arithmetic.

Manuscript reference:

NWP. v. p. 88, 85 ff. Nāgarī.

SURAJIT

Kheṭakutūhala. खेटकुतूहल

Manuscript reference:

GUJARAT. iv. p. 120, *40*, 4 ff. 1620 A.D.

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SŪRI-VIPRA. (c. 1619 A.D.)

Kheṭa-kutūhala. खेटकुतूहल 1619 A.D.

Manuscript reference:

RORI/JM. ii, *6334*, 2 ff. 18th century.

SŪRYA.

Grahavinoda. ग्रहविनोद

Manuscript reference:

GUJARAT. iv. p. 128, *84*, 5 ff.

SŪRYA.

Līlāvatī-vyākhyā. लीलावतीव्याख्या

A commentary on the *Līlāvatī* of Bhāskarācārya.

Manuscript reference:

CENSUS. *4761*, ff. 2-44. Nāgarī.

SŪRYA s.o. Bālāditya. (c. 1387-1447 A.D.)

Gaṇakānanda. गणकानन्द

An astronomical work in 2 chs., *viz.*, (i) *Madhya-grahādhikāra* and (ii) *Grahasphuṭādhikāra.*

Manuscript reference:

MADRAS/T. vol. iii. part i. Sanskrit B. ff. 56b-59b. Telugu.

SŪRYA.

Gaṇakānanda. गणकानन्द

An astronomical work in 8 chs., *viz.*, (i) Grahāstodayāṃśādhyāya, (ii) Sphuṭagrahāvabodhādhyāya, (iii) Upakaraṇādhyāya, (iv) Grahayuddha-grahasamāgamādhyāya, (v) Parilekhādhyāya, (vi) Pātavaidhṛtyadhyāya, (vii) Grahacchāyādhyāya and (viii) Śṛṅgonnatyadhāya. Possibly the author is the same as the other Sūrya, son of Bālāditya and author of a work bearing the same title.

Manuscript reference:

MADRAS/T. vol. iii. part i. Sanskrit B, *2472e*, ff. 91a-94b. Nāgarī & Telugu. 1917-18 A.D.

Sūryacandragatinirṇaya. सूर्यचन्द्रगतिनिर्णय

An anonymous astronomical work for the calculation of solar and lunar eclipses.

Manuscript reference:

MADRAS/D. xxiv. 13507, 2 ff. incomplete.

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Sūryacandragrahaṇa. सूर्यचन्द्रग्रहण
An anonymous astronomical work on solar and lunar eclipses.
Manuscript reference:
BN/AC. i. *969(v)*, Bengali. 1840 A.D.

Sūryacandragrahaṇasāriṇī. सूर्यचन्द्रग्रहणसारिणी
Anonymous tables on solar and lunar eclipses.
Manuscript reference:
RORI/JM. ii. *5259*, 5 ff. 19th century.

SŪRYA DAIVAJÑA.
Bījagaṇita-ṭīkā. बीजगणितटीका
A commentary on the *Bījagaṇita* of Bhāskarācārya.
Manuscript reference:
ANUP. iv. p. 373, *502*, 23 ff. incomplete; *503*, 62 ff. incomplete.

SŪRYADĀSA, also known as Sūrya s.o. Jñānarāja. (c. 1541 A.D.)
1. *Gaṇitāmṛtakūpikā* or *Amṛtakūpikā.* गणितामृतकूपिका, अमृतकूपिका 1541 A.D.
A commentary on the *Līlāvatī* of Bhāskarācārya.
Manuscript reference:
BORS/AB. iii. *326*, 141 ff. Nāgarī.
CP/FK. p. 224, *19*, 136 ff.
IO/JE. v. *2809*, 114 ff. Nāgarī; *2810*, 90ff. Nāgarī.
PU. ii. *3916*, 23 ff.
VVRI/VB. *3664*, 54 ff. Nāgarī. 1709 A.D.

2. *Sūryaprakāśa-bījavyākhyā.* सूर्यप्रकाशबीजव्याख्या 1541 A.D.
A commentary on the *Bījagaṇita* of Bhāskarācārya.
Manuscript reference:
AS/KBK. p. 227, Bengali.
BANARAS. p. 257, *93*, 122ff. 1832 A.D.
BERLIN. i. *832*, 129ff. 1538 A.D.
BORS/AB. iii. *216*, 93 ff. Nāgarī.
CSC/HS & SG. ix. *183*, 74 ff. Bengali.
IO/JE. v. *2823*, 73 ff. Nāgarī; *2826*, 71 ff. Nāgarī; *2825*, 134 ff. Nāgarī; *2826*, 74 ff. Nāgarī.
MADRAS/D. xxiv. *13662*, 122 ff. Grantha. incomplete.
PU. ii. *3688*, ff. 6-54+19. 1829 A.D.; *3689*, 62 ff. incomplete; *3690*, 45 ff. incomplete.
RAS/BB/HV. *279*, 46 ff. Nāgarī.

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SŪRYADEVA YAJVAN or Sūryadeva Somasuta.

1. *Bhaṭaprakāśa* or *Āryabhaṭa-sūtrārdha-prakāśikā.* भटप्रकाश, आर्यभटसूत्रार्धप्रकाशिका

A commentary on the *Āryabhaṭīya* of Āryabhaṭa. I.

Manuscript reference:

IO/AK. ii. part i, *6266*, 60 ff. Malayalam. 1865 A.D.; *6267*, 95 ff. Grantha. 19th century; *6268*, 38 ff. Grantha, 18th century.

IO/JE. v. *2767*, ff. 7+80.

MADRAS/T. vol. iv. part i. Sanskrit C, *3862C*, ff. 2a-86b. Grantha; vol. x. Sanskrit A. *6122*, 76 ff. Grantha.

TRI/TG. i. *125*, Malayalam; iv. *73*, Malayalam; *121*, Malayalam.

2. *Mānasagrahajñāna-vāsanā.* मानसग्रहज्ञानवासना

A commentary on the *Laghumānasa* of Mañjula. This commentary refers to an earlier commentary by Praśastadharācārya of Kashmir and states that Mañjulācārya had written a *Mahāmānasa.*

Manuscript reference:

MADRAS/T. vol. iii. part i. Sanskrit C, *2741*, 190ff. Grantha; vol. iv. part i. Sanskrit A, *3037*, 20ff. Grantha. incomplete.

TRI/KS. iii. *949*, 52ff. Malayalam. incomplete.

Sūryādinavagrahacakra. सूर्यादिनवग्रहचक्र

An anonymous work.

Manuscript reference:

TANJORE/PPS. xvi. *11475*, 8ff. Nāgarī.

SŪRYA GAṆAKA

Bījagaṇita-vyākhyā. बीजगणितव्याख्या

A commentary on the *Bījagaṇita* of Bhāskarācārya.

Manuscript reference:

RTL/MS. p. 166. 1ff. incomplete.

Sūryagrahādi-sādhana-siddhānta. see DURGĀŚAṄKARA.

Sūryagrahaṇādhikārasāriṇī. सूर्यग्रहणाधिकारसारिणी

Anonymous tables on solar and lunar eclipses.

Manuscript reference:

PU. ii. *4064*, 12ff. Nāgarī. 1776 A.D.

Sūryagrahaṇasambhavāsambhava. सूर्यग्रहणसम्भवासम्भव

An anonymous work on solar eclipses.

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PU. ii. *4063*, 13ff. Nāgarī.

SŪRYAMAṆI s.o. Tripāṭhī Ghanaśyāma.
Gaṇitāmṛtavarṣiṇī or *Līlāvatī-ṭīkā*. गणितामृतवर्षिणी, लीलावतीटीका
A commentary on the *Līlāvatī* of Bhāskarācārya.
Manuscript reference:
AS/PS & HS. x, *6911*, 43ff. Nāgarī. lacks the beginning.
PU. ii. *3915*, 52ff. 1800 A.D.

Sūryapakṣa-śaraṇa-karaṇa. see VIṢṆU DAIVAJÑA s.o. Divākara Daivajña.

Sūryapakṣa-śaraṇa-vyākhyā. see GOPĪNĀTHA.

Sūryaprajñaptivṛtti. see MALAYAGIRI SŪRI

Sūryaprakāśa-bīja-vyākhyā. see SŪRYADĀSA s.o. Jñānarāja.

Sūriyapannatti or *Sūrya-prajñapti*. सूरियपन्नत्ति, सूर्यप्रज्ञप्ति
c. 300 B.C.
A Jaina astronomical work. The principal source of this work is Malayagiri's commentary, *Sūryaprajñapti-vṛtti*. This has been expounded briefly by Weber and more fully by Thibaut. Bhadrabāhu is probably the author of this work. It follows *Yājuṣa and Ārca Jyautiṣa* in teaching a five-year luni-solar cycle, starting from the beginning of the summer solstice. It also incorporates many purāṇic concepts, particularly the purāṇic cosmography with Mt. Meru in the centre. It also teaches the existence of two suns, two moons and two stellar systems.
Manuscript reference:
AS/AB. *48*, 73ff. Jaina. Nāgarī.
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WINTERNITZ, M. '*Geschichte der indischen Litteratur*', **2,** 292, 316. Leipzig. 1920; **3,** 557, Leipzig, 1922.

Sūrya-puruṣa-cakrādi. सूर्यपुरुषचक्रादि

An anonymous work.

Manuscript reference:

RORI/JM. ii. *4452 (8);* 12ff. 18th century.

Sūrya-sāriṇī. सूर्यसारिणी

An anonymous astronomical work containing tables.

Manuscript reference:

PU. ii. *4067*, 5ff. Śāradā; *4068*, 4ff. Nagari.

Sūryasiddhānta. सूर्यसिद्धान्त c. 400 A.D.

A standard astronomical treatise widely accepted and followed in India, and one of the earliest of the Hindu scientific astronomical works, which began to take shape from about the fourth or the fifth century A.D. at a time when old astronomical ideas and calculations came to be revised and placed on a scientific and mathematical basis. The text in its present form is of much later development and result of many corrections and interpolations. There is considerable agreement between the *Sūryasiddhānta* as described by Varāhamihira in his *Pañcasiddhāntikā*, with the modern *Sūryasiddhānta*, but, as P. C. Sen Gupta has shown, Varāha himself amended the old version in accordance with the teachings of Āryabhaṭa (*vide:* 'Āryabhaṭa's lost works', *BCMS*, **22,** 1930; Introduction to Burgess' *Sūryasiddhānta*, Calcutta University, 1935). Regarding the authorship, the opening verses indicate that the knowledge of 'the grand system of planets' was revealed to *Asura* Maya by the sun-god himself through a person created out of his own self as no one can endure the sun's brilliance. This and an interpolated passage in the commentary have led to the conjecture that the

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work originated in the west and was probably derived from some Greek source. Weber attempted to correlate the word 'Asura Maya' with the 'Ptolemaios' of the Greek on the ground that the latter word became transformed to 'Turamaya' in Indian inscriptions of Piyadasi (*Indische Studien*, ii, 243). This speculation is no longer accepted. Albīrūnī ascribed the authorship of the *Sūryasiddhānta* to Lāṭa (*Alberuni's India*, **1**, 153), who might have prepared one of the older versions. The important place occupied by the treatise in the astronomical literature of ancient and medieval India may be easily judged from the large number of commentaries prepared on the work at different times and an abundance of manuscripts as revealed by this manuscript survey.

The work is divided into the following 14 chs.: (i) Madhyamādhikāra (on mean motions of the planets), (ii) Spaṣṭādhikāra (on true places of the planets), (iii) Tripraśnādhikāra (on the three enquiries relating to direction, place and time), (iv) Candragrahaṇādhikāra (on eclipses with special reference to the lunar eclipses), (v) Sūryagrahaṇādhikāra (on solar eclipses; it actually deals with parallax in solar eclipses), (vi) Chedyakādhikāra (on the projection of eclipses), (vii) Grahayutyadhikāra (on planetary conjunctions) (viii) Nakṣatragrahayutyadhikāra (on the asterisms), (ix) Udayāstādhikāra (on heliacal risings and settings), (x) Śṛṅgonnatyadhikāra (on the moon's rising and setting and on the elevation of the moon's cusps), (xi) Pātādhikāra (on the pātas or faults, i.e. the malignant aspects of the sun and the moon, mainly of astrological import), (xii) Bhūgolādhyāya (on cosmology, geography, and dimensions of the creation), (xiii) Jyotiṣopaniṣadādhyāya (on instructions on astronomical instruments, armillary spheres etc.), and (xiv) Mānādhyāya (on reckoning time).

Manuscript reference:

ANUP. v. *48*, 36ff.; *49*, 18ff. 1658 A.D.

AS/HS & PS. x. *6940*, ff. 1-44, 1-87. Nāgarī. 1792 A.D.; *6941*, 166ff. Newari. 1710 A.D.; *6942*, 221ff. Nāgarī; *6943*, 52ff. Nāgarī.

BANARAS. p. 257, *84*, 19ff.

BC/HS. *28*, 24ff. Nāgarī. 1837 A.D.; 29ff. Nāgarī. 1834 A.D.

BERLIN. i. *836*, 23ff. 1621 A.D.; *837*, 23ff. 1783 A.D.; *838*, 17-30; *839*, 29ff.

BIK/RM. *736*, 141ff. Nāgarī; *737*, 18ff. Nāgarī.

BM/CB. *436*, 15ff. 1825 A.D.; *437*, 56ff. 1828 A.D.; *438*, ff. 65-126. Nāgarī. 19th century. incomplete.

BN/AC. i. *973* (*iii*), Bengali. 1840 A.D.; *995*, Bengali. 1840 A.D.; *996*, Nāgarī. 1790 A.D.

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BORS/AB. iii. *420*, 25ff. Maithili. 1848 A.D.; *420A*, 30ff. Maithili; *420B*, 22ff. Maithili; *420C*, 21ff. Maithili. 1837 A.D.; *420D*, 20ff, Maithili. 1835 A.D.; *420E*, 19ff. Maithili. 1835 A.D.; *420F*, 17ff. Maithili; *420G*, 15ff. Maithili.
CP/FK. p. 246, *180*, 22ff. incomplete.
IO/AK. ii. part i, *6274*, 28ff. Nāgarī. 1800 A.D.; *6275*, 30ff. Malayalam. Breaks off in ch. 13; *6276*, 28ff. Nāgarī. c 1800 A.D.; *6277*, ff. 119-246. Nandīnāgarī. c 1700 A.D.; *6278*, 188ff. Grantha. 1853 A.D.; *6279*, 50ff. Grantha. c 1810 A.D.; *6280*, 100 ff. Grantha. c. 1800 A.D.; *6281*, 43ff. Grantha. c 1850 A.D. Golādhyāya only; *6282*, 72ff. Grantha. c. 1800 A.D. Sphuṭādhyāya only.
IO/CT & FT. p. 53, *86*, 44ff. Nāgarī. 1789 A.D.
IO/JE. v. *2772*, 22ff. Nāgarī; *2773*, 33ff. Bengali; *2774*, 3ff. Nāgarī. Fragment; *2775*, ff. 176+47+27. Nāgarī. 18th century; *2776*, ff. 11+34. Nāgarī; *2777*, ff. 110+32+14. Nāgarī. 1792 A.D.
M & C/LR. *345*, Nāgarī; *346*, Nāgarī; *347*, Kanarese.
MAC/HW. p. 162, Nāgarī. Golādhyāya only.
MADRAS/D. xxiv. *13510*, 190ff. Telugu; *13511*, Telugu; *13512*, 268ff. Telgugu & Nandīnāgarī; *13513*, 39ff. Telugu.
MADRAS/T. vol. iii. part i. Sanskrit B, *2533* (*l*), ff. 60a-75b. Telugu; vol. iii. part i. Sanskrit C. *2694*, 102ff. Nāgarī & Malayalam. 1918-19 A.D.; vol. v. part i. Sanskrit A, *4276* (*b*), ff. 26a-33a. Telugu. Breaks off in ch. 3.
MYSORE/AM. p. 51, *16*, 61ff. Nāgarī. Breaks off in ch. 7; 227, 143ff. Nāgarī. Breaks off in ch. 7.
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NWP. i. p. 564, *166*, 25ff. Nāgarī.
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Commentator:

Allanāryasūri, Amareḍya, Āryabhaṭa, Bhūdharasūri, Caṇḍeśvarācārya, Cola, Dādābhāi, Kāma, Kamalākara, Kṛṣṇa Daivajña, Ḳumāraṭanayayogin, Madanapāla, Mādhavā-

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cārya, Mallikārjuna, Nṛsiṃha, Parameśvara, Raṅganātha, Śrīkaṇṭha, Tammaya, Viśvanātha Daivajña and Yallaya.

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Manuscript reference:
TAYLOR. i. p. 318, *1536*, Kanarese.

Sūryasiddhāntabhāṣya. see CAṆḌEŚVARĀCĀRYA.

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Manuscript reference:
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Sūryasiddhāntaprakāśa. see ĀRYABHAṬA I.

Sūryasiddhāntarahasya. see RĀGHAVĀNANDA CAKRAVARTIN.

Sūryasiddhāntasaṅgraha. see ŚAMBHU ŚARMAN.

Sūryasiddhāntasāra. see MALLAYA YĀYAJŪKA.

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Manuscript reference:
NWP. ix. p. 50, *27*, 21ff. Nāgarī.

Sūryasiddhānta-sphuṭādhyayana-vyākhyāna. see KUMĀRATANAYA YOGIN.

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Sūryasiddhānta-subodhinī. सूर्यसिद्धान्तसुबोधिनी
An anonymous astronomical work.
Manuscript reference:
MADRAS/D. xxiv. *13396*, Telugu.

Sūryasiddhāntatantrapradīpa. see YOGĪ.

Sūryasiddhāntaṭīkā. see DHANEŚVARA BHAṬṬA.

Sūryasiddhāntaṭīkā. see MĀDHAVĀCĀRYA.

Sūryasiddhāntaṭīkā. see SUDHĀKARA DVIVEDIN.

Sūryasiddhāntaṭīkā. सूर्यसिद्धान्तटीका
An anonymous commentary on the *Sūryasiddhānta*.
Manuscript reference:
ANUP. v. p. 403, *948*, 24ff. incomplete.

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Manuscript reference:
BN/AC. i, *304(iv)*, Bengali. 1840 A.D.
NWP. ii. p. 140. 34ff.

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Sūryasiddhānta-vivaraṇa. see BHŪDHARA SŪRI.

Sūryasiddhānta-vivaraṇa. see DĀDĀBHĀI s.o. Mādhava Gāṃkar.

Sūryasiddhānta-vivaraṇa. see PARAMEŚVARA.

Sūryasiddhānta-vivaraṇa. सूर्यसिद्धान्तविवरण
An anonymous commentary on the *Sūryasiddhānta*.
Manuscript reference:
BORS/AB. iii, *422*, 24ff. Maithili. 1858 A.D. incomplete.

Sūryasiddhānta-vyākhyā. see COLA SŪRI s.o. Āryasūrya.

Sūryasiddhānta-vyākhyā. see KĀMA.

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Sūryasiddhānta-vyākhyā. see PARAMEŚVARA.

Sūryasiddhānta-vyākhyā. see. ŚRĪKAṆṬHA.

Sūryasiddhānta-vyākhyāna. see MALLIKHĀRJUNA.

Sūryasiddhāntodāharaṇa. सूर्यसिद्धान्तोदाहरण
An anonymous commentary on the *Sūryasiddhānta.*

Manuscript reference:
CSC/HS & SG. ix. *182*, 50ff. Nāgarī. incomplete.
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Sūryasiddhāntodāharaṇa. see VIŚVANĀTHA DAIVAJÑA.

Sūryasomoparāgalakṣaṇa. सूर्यसोमोपरागलक्षण
An anonymous treatise on the eclipses of the sun and the moon.

Manuscript reference:
TANJORE/PPS. xvi. *11664*, ff. 15-36. Telugu.

Suyantrāgama. see MAHENDRA SŪRI.

TAMMAYA or Tamma Yajvan, s.o. Mallayajvan, grandson of Honnārya and resident of Parigi on the west.

1. *Grahaṇādhikāra.* ग्रहणाधिकार
An astronomical work on the eclipses of the sun, being an expansion of the rules of the *Sūryasiddhānta* in 8 chs.

Manuscript reference:
MAC/HW. p. 168, 51 ff. Grantha.

2. *Grahaṇadvayādhikāra.* ग्रहणद्वयाधिकार

Manuscript reference:
CP/HL. p. 143, *1531.*

3. *Kāmadogdhrī.* कामदोग्ध्री
A commentary on the *Sūryasiddhānta.*

Manuscript reference:
HULTZSCH. ii. *1068*, 24 ff. Grantha. incomplete.
10/AB. ii. part i, *6278*, 188 ff. Grantha. 1853 A.D.; *6279*, 50 ff. Grantha. 1810 A.D. only Madhyamādhikāra; *6280*, 100 ff. Grantha. 1800 A.D. lacks the beginning.

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M & C/LR. *339*, Nāgarī; *348*, Nāgarī.
MAC/HW. p. 162, *6*, Grantha. only Madhyamādhikāra.
MADRAS/T. vol. iv. part i. Sanskrit C, *3906*, 214 ff. Grantha; vol. vii. part i. Sanskrit, *5418*, 64 ff. Nāgarī; *5499*, 221 ff. Nāgarī. chs. 3-14 only; vol. x. Sanskrit A, *6303*, 80 ff. Telugu. incomplete.
OPPERT. i. *1412*, 112 ff.
RAS/MW. *12*(*2*), 246 ff. Grantha.

Tantrasaṃgraha. see NĪLAKAṆṬHA SOMASUTVAN

Tantrasaṃgraha-kriyākalpa-vyākhyāna. तन्त्रसंग्रहक्रियाकल्पव्याख्यान
An anonymous commentary on the *Tantrasaṃgraha* of Nīlakaṇṭha Somasutvan.
Manuscript reference:
RAS/MW. *134*, 129 ff. Malayalam.

Tantrasaṃgraha-laghuvyākhyā. तन्त्रसंग्रहलघुव्याख्या
An anonymous commentary on the *Tantrasaṃgraha* of Nīlakaṇṭha Somasutvan.
Manuscript reference:
PU. ii. *3494*, 81 ff. Tamil; *3495*. 69 ff. Tamil.

Tantrasaṃgraha-vivṛti. तन्त्रसंग्रहविवृति
An anonymous commentary on the *Tantrasaṃgraha* of Nīlakaṇṭha Somasutvan.
Manuscript reference:
TRI/TG. v. p. 24. Malayalam; vii. p. 74. Tamil.

Tantrasaṃgraha-vyākhyā. तन्त्रसंग्रहव्याख्या
An anonymous commentary on the *Tantrasaṃgraha* of Nīlakaṇṭha Somasutvan.
Manuscript reference:
MADRAS/T. vol. iii. part i. Sanskrit B, *2505*, 140 ff. Nāgarī. 1917-18 A.D.
VVRI/VB. p. 77, *3810*, 195 ff. Malayalam.

Tārakasiddhānta. तारकसिद्धान्त
An anonymous astronomical work.
Manuscript reference:
HULTZSCH. ii. *935*, 60 ff. Grantha. incomplete.

Tārāpatha-prakāśikā. तारापथप्रकाशिका
An anonymous treatise for determining the positions of the

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heavenly bodies and other particulars, required for the preparation of a calendar.

Manuscript reference:

MADRAS/D. xxiv. *13427*, 32 ff. Telugu.
MADRAS/T. vol. iii. part i. Sanskrit B, *2472(d)*, ff. 73a-90b. Nāgarī. 1917-18 A.D.

Tārāvalī. तारावली

An anonymous metrical treatise in 27 stanzas, laying down the rules for the preparation of a calendar.

Manuscript reference:

MADRAS/T. vol. ii. part i, Sanskrit C, *1731(a)*, ff. 1a-15b. Nāgarī. 1915-16 A.D.

Tārāvilāsa. see VAIDYANĀTHA.

Tatkālabodhakayantra. तत्कालबोधकयन्त्र

An anonymous work.

Manuscript reference:

PU. ii. *3483*, 2 ff. Nāgarī.

Tātkālikapañcāṅganayanaprakāra. तात्कालिकपञ्चाङ्गनयनप्रकार

An anonymous work.

Manuscript reference:

PU. ii. *3529*, 3 ff. Nāgarī.

Tattvacintāmaṇi. see DIVĀKARA s.o. Nṛsiṃha.

Tattvapañcāśikā. see ŚRĪPATI.

Tattvapradīpa. see ŚRĪPATI.

Tattvaprakāśikā. see RĀMAKṚṢṆA BHAṬṬA s.o. Kendra Bhaṭṭa.

Tattvaviveka-vyākhyā. see NĪLĀMBARA JHĀ.

Tattvavivekavyākhyā. see RAGHUNĀTHA & VEṄKAṬEŚA.

ṬIPPANA.

Uparāga-darpaṇa. उपरागदर्पण

An astronomical treatise giving the time of the eclipses, occurring in each year during the period of 1,020 years, extending from Śaka 1429 expired (1507 A.D.) to Śaka 2449 (2527 A.D.)

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It consists of 17 sections, each section dealing with one cycle of 60 years. It contains information from the *Kālayukti* year of the sixth cycle of 60 years to the end of the 17th cycle.

Manuscript reference:

MADRAS/T. vol iii. part i. Sanskrit A, *2136*, ff. 1a-28a. Grantha. 1916-17 A.D.

Tithibhūṣaṇa. तिथिभूषण

An anonymous work.

Manuscript reference:

GUJARAT. iv. p. 146, *186*, 10 ff.

Tithicakra. see NARASIṂHA s.o. Naupuri.

Tithicintāmaṇi. see GAṆESA DAIVAJÑA s.o. Keśava Daivajña.

Tithicintāmaṇi. see GAṆEŚA SĀṂVATSARA.

Tithicintāmaṇikoṣṭhakāni. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

Tithicintāmaṇi-sāriṇī. तिथिचिन्तामणिसारिणी

An anonymous table based on the *Tithicintāmaṇi* of Gaṇeśa Daivjña.

Manuscript reference:

UJJAIN. p. 51, *163.*

Tithicintāmaṇiṭīkā. see NṚSIṂHA s.o. Kṛṣṇa Daivajña.

Tithicintāmaṇiṭīkā. see YOGEŚVARA DAIVAJÑA.

Tithicintāmaṇi-udāharaṇa. see VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña.

Tithicintāmaṇi-vyākhyā. तिथिचिन्तामणिव्याख्या

An anonymous commentary on the *Tithicintāmaṇi* of Gaṇeśa Daivajña.

Manuscript reference:

PU. ii, *3534*, 11 ff. Nāgarī.

Tithicintāmaṇi-vyākhyā-kānti. तिथिचिन्तामणिव्याख्याकान्ति

An anonymous commentary on the *Tithicintāmaṇi* of Gaṇeśa Daivajña.

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Manuscript reference:
PU. ii. *3535*, 27 ff. Nāgarī.

Tithidarpaṇa. see MURĀRI s.o. Nārāyaṇa.

Tithidīpikā. see ANANTA BHAṬṬA.

Tithikālanirṇaya. तिथिकालनिर्णय
An anonymous work.
Manuscript reference:
PU. ii. *3530*, 3 ff. Nāgarī.

Tithikalpadruma. see DHARMACANDRA.

Tithikalpadruma. see KALYĀṆA.

Tithi-lalla. see GOSVĀMĪ.

Tithimañjarī. see GAṆEŚA s.o. Jñāneśvara.

Tithinirṇaya. see BHAṬṬOJI DĪKṢITA s.o. Lakṣmīdhara.

Tithinirṇaya. see. GAṄGĀRĀMA.

Tithinirṇaya. तिथिनिर्णय
An anonymous work on the calculation of *tithis*.
Manuscript reference:
HULTZSCH. ii. *1393*, 25 ff. Nāgarī.
NEPAL/HS. ii. *III 338 B*, 15 ff. Newari.

Tithipatra. see MAKARANDA.

Tithipàtra-nīrāñjanāvalī. see ŚRĪPATI.

Tithi-prakāśa. see GAṄGĀDĀSA TRIVEDIN.

Tithirāja. see KṚṢṆA.

Tithiratnamālā. see NĪLAKAṆṬHA JYOTIRVID.

Tithisāraṇikā. see DAŚABALA.

Tithisārīṇī. see JAYA GOSVĀMIN.

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Tithisāriṇī. see TRIVIKRAMA.

Tithisiddhi. see GAṆEŚA DAIVAJÑA s.o. Keśava Daivajña.

Tithisiddhikāmadhenu. see VOPADEVĀCĀRYA.

Tithiyōganakṣatradhruvāṅka. तिथियोगनक्षत्रध्रुवाङ्क
An anonymous work.
Manuscript reference:
PU. ii. *3538*, 14 ff. Nāgarī.

Tithyadhikāra. see KĀŚĪŚVARA.

Tithyadhikāraṭīkā. see ŚATĀNANDA.

Tithyādicintāmaṇi. see DINAKARA.

Tithyādiciṇtāmaṇi. see VIŚVANĀTHA DAIVAJÑA.

Tithyādikāmadhenu. see MAHĀDEVA s.o. Vopadeva.

Tithyādinirṇaya. तिथ्यादिनिर्णय
An anonymous work showing the methods of calculating *tithis*.
Manuscript reference:
UJJAIN. p. 51, *97*, 4ff. incomplete.

Tithyādipatra-vyākhyā. see HARIKARṆA s.o. Sundara Śarman.

Trilokasāravṛtti. त्रिलोकसारवृत्ति
An anonymous commentary on the *Trilokasāra*, a Jaina work on astronomy.
Manuscript reference:
RAS/MW. *III(3)*, 37 ff. Grantha. 18th century. fragment.

TRIPURĀRI (later than 1627 A.D.)

Pañcāṅga-śiromaṇi. पञ्चाङ्गशिरोमणि
A treatise on the calculations to be made in preparing a calendar.

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Manuscript reference:
MADRAS/T. vol. i. part i. Sanskrit B, *457(d)*, ff. 137a-207a Telugu. incomplete.

Triśatīgaṇitasāra. see ŚRĪDHARĀCĀRYA.

Triśatikā. see ŚRĪDHARĀCĀRYA.

Trividhacakranirṇaya. त्रिविधचक्रनिर्णय
An anonymous work.
Manuscript reference:
MADRAS/D. xxiv. *13428*, 22 ff.

TRIVIKRAMA.
Jyotiṣābharaṇa or *Trivikramaśataka.* ज्योतिषाभरण, त्रिविक्रमशतक
A short manual on astronomy.
Manuscript reference:
ANUP. iv. p. 358, *3890*, 23 ff. 1658 A.D.
IO/JE. v. *2884*, 7 ff. Bengali.
UDAIPUR. p. 56, *567*.

TRIVIKRAMA.
Tithisāriṇī. तिथिसारिणी
An astronomical table on *tithis*
Manuscript reference:
GUJARAT. iv. p. 148, *189*, 9 ff. 1748 A.D.

TRIVIKRAMĀCĀRYA.
Siddhānta-tattva. सिद्धान्ततत्त्व
Manuscript reference:
RORI/JM. ii. *5622*, 7 ff. 1895 A.D.

Trivikramaśataka. see TRIVIKRAMA

TRYAMBAKA BHAṬṬA.
1. *Grahalāghava.* ग्रहलाघव
Manuscript reference:
CP/HL. p. 146, *1573*.

2. *Grahasvarūpa.* ग्रहस्वरूप
Manuscript reference:
CP/HL. p. 147, *1588*

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TULAJARĀJA.

Vākyāmṛta. वाक्यामृत

Manuscript reference:
TANJORE/AB. p. 76. 71 ff. Nāgarī.

Ubhayagrahaṇavyavasthādhikāra. उभयग्रहणव्यवस्थाधिकार
An anonymous work.
Manuscript reference:
NOTICES/HS. iv. *42*, 3 ff. Bengali.

Udāharana. उदाहरण 1671 A.D.
An anonymous commentary on the *Dhīkoṭīkaraṇa* of Śrīpati.
Manuscript reference:
RAS/BB/HV. *244*, 5 ff. Nāgarī.

Udāharaṇa. see YĀDAVA.

UDAYADIVĀKARA.

Sundarī. सुन्दरी
A commentary on the *Laghubhāskarīya* of Bhāskara I.
Manuscript reference:
TRI/KS. iv. *942*, 50 ff. Malayalam; *943*, 92 ff. Malayalam; *944*, 120 ff. Malayalam; *945*, 160 ff. Malayalam; *977*, 143 ff. Malayalam.

Uḍudaya-pradīpa. see JĪVANĀTHA JHĀ.

Ukārākhya-grantha. see NAYANASUKHOPĀDHYĀYA.

Upadeśasūtra. see JAIMINI.

Upagraha. उपग्रह
An anonymous work
Manuscript reference:
TANJORE/PPS. xvi. *11680*, 4 ff. Grantha.

Uparāga-darpaṇa. see ṬIPPAṆA.

Uparāga-kriyākrama. see NĀRĀYAṆA.

VĀCASPATI.

Pañcāṅga-dīpikā. पञ्चाङ्गदीपिका
Manuscript reference:
CP/HL. p. 260, *2800*.

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VĀCASPATI MIŚRA.

Siddhānta-śiromaṇiṭīkā. सिद्धान्तशिरोमणिटीका

A commentary on the *Siddhānta-śiromaṇi* of Bhāskarācārya.

Manuscript reference:

GUJARAT. iv. p. 208, *521*, 56 ff. 1768 A.D.

VAIDYANĀTHA.

Tārāvilāsa. ताराविलास

An astronomical work containing the description of the stars and the planets together with their directions.

Manuscript reference:

NWP. i. p. 574, *186*, 3 ff. Nāgarī.

RORI/JM. ii. *7379*, 2 ff. 19th century.

VAIJYANĀTHA.

Ratnamālāṭīkā. रत्नमालाटीका

A commentary on the *Jyotiṣaratnamālā* of Śrīpati.

Manuscript reference:

GUJARAT. iv. p. 184, *394*, 77 ff. 1583 A.D.

Vaiṣṇavakaraṇa. see ŚAṄKARA s.o. Śukadeva Bhaṭṭa.

Vākya. see VARARUCI.

Vākyaganita. वाक्यगणित

An anonymous treatise dealing with the method of determining the position of the planets in a given year (c. 1806-1866 A.D.).

Manuscript reference:

MADRAS/D. xxiv. *13499*, 39 ff.; *13500*, 27 ff. Grantha; *13501*, 9 ff. Telugu; *13502*, 17 ff. Grantha & Tamil.

Vākyakaraṇa or *Vākya-pañcāṅga-karaṇa* or *Vākyakaraṇa-siddhānta.* वाक्यकरण, वाक्यपञ्चाङ्गकरण, वाक्यकरणसिद्धान्त

This anonymous work which belongs to the Ārya-school is a guide book for the preparation of the solar *pañcāṅgas* in Tamil and Malayalam speaking countries of Southern India. The principles explained in this and similar works of the Ārya-school have been in use for the purpose of calendar making from very ancient times and are in use even today [cf RAS/MW. *68 (1)*]. It contains tables of calculations for finding the exact positions of the planets like Mars, Mercury, Jupiter, Venus and Saturn. Sundararāja who wrote a commentary on this

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work, entitled *vākyakaraṇadīpikā*, refers to many ancient astronomers like Brahmagupta, Āryabhaṭa, Lalla, Nateśa, Pūrva, Dāmodara, Parameśvara Vaṭacceri, Keralanīlakaṇṭha etc. but not the author of the present work by name. It contains the following 6 chs. *viz.*, (i) Pañcāṅgarāhucāra, (ii) Grahacāra, (iii) Chāyādhikāra, (iv) Grahaṇādhikāra, (v) Udayāstamayādhikāra, (vi) Pātavedhavṛtti (?).

Manuscript reference:

AS/HS & PS. x. *6927*, 5 ff. Nāgarī. 1639 A.D.
IO/AK. ii. part i, *6308*, 64 ff. Kanarese. 18th century.
MAC/HW. p. 169, 52, Kanarese.
MADRAS/D. xxiv. *13494*, 102 ff. Kanarese; *13495*, 39 ff. Telugu; *13496*, 59 ff. Grantha. incomplete.
MADRAS/T. vol. iv. part i. Sanskrit C, *3877(n)*, ff. 81-88b Grantha; *3943(b)*, ff. 7a-22a. Grantha.
MYSORE/AM. p. 50, *28*, ff. 3-6. Nāgarī.
TANJORE/PPS. xvi. *11595*, 33 ff. Grantha; *11596*, ff. 13-43. Grantha; *11597*, ff. 7-41. Nāgarī.
TRI/KS. iv. *955*, 10 ff. Grantha.

Commentator:

Sundararāja.

Printed text, translations etc.

Vākyakaraṇa, with the commentary of Sundararāja. Published by K. V. Sarma. K.S.R. Institute, Madras-4, 1962.

Study:

Although studies on this particular work are not noticed, there exist a number of important studies on the *Vākya* astronomical process, which are given below:

Krishna Rav, I. V. M. 'The motion of the moon in Tamil astronomy', *CENTAURUS*, **4**, 198-220, 1955-56.

Le Gentil. 'Mémoire Sur l'Inde', Histoire de l'Acad. royal des sciences, année 1772 (2e partie), Paris, 1776. Mém de math. et phys., 169 & 221.

Neugebauer, O. 'Tamil Astronomy—a study in the history of astronomy in India', *OSIRIS*, **10**, 252-76, 1952.

Waerden, B. L. Van der. 'Tamil Astronomy', *CENTAURUS*, **4**, 221-34, 1955-56.

Warren, J. *Kāla-Saṃkalita.*—a collection of memoirs on the various modes according to which the nations of southern India divide time. 1825.

Vākyakaraṇadīpikā. see SUNDARARĀJA s.o. Anantanārāyaṇa.

Vākyāmṛta. see TULAJĀRĀJA.

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Vākyapañcāṅgādhyāyī-vyākhyā. वाक्यपञ्चाङ्गाध्यायीव्याख्या
An anonymous commentary on the Vākyapañcāṅgādhyāyī.
Manuscript reference:
MADRAS/T. vol. iv. part i. Sanskrit C, *3877* (*j*), ff. 102a-108b. Grantha. incomplete.

Vākyapañcāṅgakaraṇa. see VĀKYAKARAṆA

Valana-vyākhyā. see NĪLĀMBARA JHĀ.

Valayayantra. वलययन्त्र
An anonymous work.
Manuscript reference:
RAS/BB/HV. *245*, Nāgarī.

VANAMĀLĪ.
Bhāsvatī-vyākhyā. भास्वतीव्याख्या
A commentary on the *Bhāsvatī* of Śatānanda in Prākṛita.
Manuscript reference:
BANARAS. p. 262, *78*, ff. 1-11, 13-39

VARADARĀJA
Gaṇitasārasaṅgraha-vyākhyā. गणितसारसङ्ग्रहव्याख्या
A commentary on the *Gaṇitasārasaṅgraha* of Mahāvīrācārya.
Manuscript reference:
CP/HL. p. 636, *7120-7146.*

VARĀHAMIHIRA. (c. 505 A.D.)
1. *Bṛhajjātaka.* बृहज्जातक
It is primarily an astrological work. Its importance lies in the use, probably for the first time in India, of the zodiac, with Greek names of the zodiacal signs and planets. Some of the names frequently employed by Varāhamihira are as follows: Kriya- κριός, Tāvuri- ταυρος, Jituma- διδυμος, Kulīra- κόλουρος, Leya- λε′ων, Pāthona- παρθε′νος, Jūka- ζυγόν, Kaurpya- σκορπιος, Taukṣika- τοξότης, Ākokera- αἰγόκερ′ως, Hṛdroga- υ′δροχοος etc. Other Greek technical terms found in the work are: dreṣkāṇa or dṛkkāṇa, liptā, anaphā, sunaphā, durudharā, kemadruma, kendra, panapharā, trikoṇa, hibuka, jāmitra, meṣūraṇa etc. Similarity of these technical terms with those in use in Greek works was pointed out long ago by Jesuit Father Pons, Whish, Lassen and Kern. *Bṛhajjātaka* and the author's another work *Horā Śāstra* bear testimony to the introduction

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into India of the Greek or more probably Alexandrian astrology and along with it other important astronomical concepts which later on found integrated into the Indian system. A work in 25 chs. viz. (i) Rāśiprabhedādhyāya, (ii) Grahayonibhedādhyāya, (iii) Viyonijanmādhyāya, (iv) Niṣekādhyāya, (v) Jātakādhyāya, (vi) Sadyomaraṇādhyāya, (vii) Āyurdāyādhyāya, (viii) Daśāpākādhyāya, (ix) Aṣṭakavargādhyāya, (x) Karmājīvādhyāya, (xi) Rājayogādhyāya, (xii) Nābhasayogādhyāya, (xiii) Candrayogādhyāya, (xiv) Dvigrahādhyāya, (xv) Pravrajyāyogādhyāya, (xvi) Rāśiśīlādhyāya, (xvii) Dṛṣṭiphalādhyāya, (xviii) Bhāvādhyāya, (xix) Āśrayayogādhyāya, (xx) Prakīrṇādhyāya, (xxi) Aniṣṭādhyāya, (xxii) Strījātakādhyāya, (xxiii) Niryāṇādhyāya, (xxiv) Naṣṭajātakādhyāya, (xxv) Drekkāṇādhyāya.

Manuscript reference:

AS/HS & PS. x. p. 382, *7197*, ff. 7-43, Nāgarī. 1693 A.D.; *7198*, 10 ff. Nāgarī; p. 384, *7199*, Nāgarī. 1835 A.D. complete text with incomplete commentary of Mahīdhara; *7200*, text with Mahīdhara's commentary; p. 385, *7201*, 8 ff. Nāgarī. 17th century; *7202*, 93 ff. Nāgarī. 18th century. incomplete at the end, text with Mahīdhara's commentary; p. 386, *7203*, 67 ff. Nāgarī. 1817 A. D.; p. 388, *7205*, the manuscript begins from the 8th ch. and ends in the 26th ch.; *7206*, 60 ff. Nāgarī. 1858 A.D. complete; p. 389, *7207*, 7 ff. Nāgarī. contains from 19th to 27th ch.; *7208*, 251 ff. Nāgarī. 1866 A.D. text with the commentary of Bhaṭṭotpala.

Printed text, translations etc.

Bṛhajjātaka with commentary *vivṛti* by Bhaṭṭotpala, Bombay, 1863.

Bṛhajjātaka. Translated into English by N. C. Iyer, Madras, 1885.

Bṛhajjātaka. Tr. by Swāmī Vijñānānanda. Sacred Book of the Hindus no 12, Allahabad, 1912.

2. *Bṛhatsaṃhitā*. बृहत्संहिता

It is an encylopaedic compendium, containing a large number of references to astronomers who flourished during or before the time of Varāha and is of considerable importance from the point of view of the history of astronomy.

Manuscript reference:

AS/HS & PS. x. p. 131, *6961*, 136 ff. Udiya. complete, 19th century; p. 133, *6963*, 209 ff. of which 75th to 136th leaves, the 143rd and the 196th to 201 leaves are missing. Nāgarī. 1876 A.D.

IO/JE. v. p. 1055, *2979*, 154 ff. Nāgarī. 1749 A.D.; p. 1056, *2980*, Nāgarī. 1813 A.D.; p. 1056, *2981*, 82 ff. Bengali; p. 1056, *2982*, 136 ff. of which 1-4, and 125-135 are missing. Nāgarī. 1650 A.D.; p. 1056, *2983*, 37 ff. Nāgarī. 1750 A.D. fragment.

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Commentator:

Bhaṭṭotpala.

Printed text, translations etc.

The *Bṛhatsaṃhitā*. A treatise on astrology. Ed. by Dr. H. Kern; *Bibliotheca Indica*, **48,** Calcutta, 1865.

Bṛhatsaṃhitā. Ed. by Jīvānanda Bhaṭṭācārya, Calcutta, 1880.

Bṛhatsaṃhitā. with a Hindi translation by Bālā Śāstrī, Benares, 1880.

Bṛhatsaṃhitā, Ed. by Pañcānana Tarkaratna. Revised by Vīrsiṃha Śāstrī and Dhīrānanda Kāvyanidhi, Calcutta, 1892. reprinted 1910.

Bṛhatsaṃhitā, with the commentary of Bhaṭṭotpala. Ed. by Sudhākara Dvivedin, 2 vol. Vizianagram Sanskrit Series no. 10. Benares, 1895-97.

Bṛahatsaṃhitā, with an English translation by V. Subrahmanya Śāstrī, **1** & **2,** 947.

Study:

BENTLEY, J. *Historical view of Hindu Astronomy*, 118, Calcutta, 1823.

CHAKRAVARTY, GURUGOVINDA. 'Growth and development of permutation and combination in India', *BCMS*, **24,** 79-88, 1932.

DAS, SUKUMAR RANJAN. 'Cosmographical theories of the Hindu astronomers', *IHQ*, **3,** 599-603, 1927.

JONES, SIR WILLIAM. 'A supplement to the study of Indian chronology', *AR*, **2,** 389-403, 1807.

KANE, P. V. 'Varāhamihira and Utpala: their works and predecessors', *JBBRAS*, **24,** 1-31, 1948-49.

KAYE, G. R. *Hindu Astronomy*, *ASI/M*, **18**, 35, 37, 47, Calcutta, 1924.

WINTERNITZ, M. *Geschichte der indischen Litteratur*, **3,** 567, Leipzig, 1922.

3. *Pañcasiddhāntikā.* पञ्चसिद्धान्तिका

A short work expounding the five old *Siddhāntas* prevalent in his time *i.e.*, *Pauliśa*, *Romaka*, *Vāśiṣṭha*, *Saura* and *Paitāmaha*. All these five *Siddhāntas* are different from the modern *Siddhāntas* and are now lost.

Manuscript reference:

IO/AK. ii. part i, *6288*, 20 ff. Nāgarī. 1880 A.D.

ZDMG/42. p. 549, *268*, 20 ff. 1879 A.D.

Printed text, translations etc.

Pañcasiddhāntikā, the text edited with an original commentary in Sanskrit and an English translation and introduction by G. Thibaut and M. M. Sudhākara Dvivedi, Benares. 1889. Reprinted, Motilal Benarasidas. Benares, 1930.

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Pitāmahasiddhānta and *Vṛddhavaśiṣṭhasiddhānta*. Ed. by Vindhyeśvarī Prasād Dvivedi, Benares, 1917. (see under *Jyautiṣa-siddhāntasaṃgraha*.)

Study:

BENTLEY, J. *Historical view of Hindu Astronomy*, 138-142, 171 Calcutta, 1823.

BURGESS. J. 'The sines of arcs in the Pañcasiddhāntikā', *IA*. **20,** 228, 1891.

DAS, SUKUMAR RANJAN. 'Motion of the earth as conceived by the ancient Indian astronomers', *BCMS*, **17,** 173-82, 1926.

DAS, SUKUMAR RANJAN. 'Alleged Greek influence on Hindu astronomy', *IHQ*, **4,** 68-77, 1928.

DAS, SUKUMAR RANJAN. 'Astronomical instruments of the Hindus,' *IHQ*, 256-269, 1928.

DAS, SUKUMAR RANJAN. 'Cosmographical theories of the Hindu Astronomers', *IHQ*, **3,** 599-603, 1927.

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DAS, SUKUMAR RANJAN. 'Co-ordinates used in Hindu Astronomy', *AMM*, **35,** 535-40, 1928.

FLEET, J. F. 'Some Hindu values of the dimensions of the earth', *JRAS*, 463-70, 1912.

JONES, SIR WILLIAM. 'A supplement to the study on Indian chronology', *AR*, **2,** 389-403, 1807.

KAYE G. R. *Hindu Astronomy*, *ASI/M*, **18,** 5, 27, 31, 35, 42, 47-48, 52-53, 55, 66, 71, 85-91, Calcutta, 1924.

KAYE, G. R. 'Ancient Hindu Spherical Astronomy', *JASB*, n.s. **15,** 153-189, 1919.

KANE, P. V. Varāhamihira and Utpala: their works and predecessors', *JBBRAS*, **24,** 1-31, 1948-49.

NEEDHAM, J. *Science and Civilisation in China*, **3,** 108, 149, 395 (c) Cambridge, 1954.

PISHAROTI, K. RAMA. 'Śāstras—Practical and Theoretical', *QJMS*, **21,** no. 3, 206-231, 1931.

SARTON, GEORGE. *Introduction to the History of Science*, **1,** 387, 409, 416, 419, 428-29, 707, Baltimore. Reprint, 1950.

ŚĀSTRĪ, T. S. KUPPANNA. 'The Vāśiṣṭha, sun and moon in Varāhamihira's Pañcasiddhāntikā, *JORM*, Part ii, **18,** 65-83, 1948.

SCHMIDT, OLAF. 'On the computation of the Ahargaṇa', *CENTAURUS*, **2,** 140-180, 1951-53.

SINGH A. N. 'Hindu Trigonometry', *PBMS*, n.s. **1,** 77-92, 1939.

SMITH, D. E. *History of Mathematics*, **1,** 145, 152, 154, 156. Dover edition, 1958.

THIBAUT. G. 'Notes from Varāhamihira's Pañca-siddhāntikā', *JASB*, **53,** no 2, 259-293, 1884.

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WILKINSON, LANCELOT. 'On the use of the Siddhāntas in the work of Native education', *JASB*, **3**, 504-519, 1834.
WINTERNITZ, M. *Geschichte der indischen Litteratur*, **3**, 557-559, Leipzig, 1922.

Vāranakṣatrarāśinighaṇṭu. वारनक्षत्रराशिनिघण्टु

An anonymous work.

Manuscript reference:

UJJAIN. p. 8, *1535*, 3 ff. incomplete.

VARARUCI.

Vararuci-vākya or *Gīrnāḍī-vākya* or *Pañcāṅga-vākya* or *Vākya.* वररुचिवाक्य, गीर्नादिवाक्य, पञ्चाङ्गवाक्य, वाक्य

A short treatise on the calculation of the position of the planets.

Manuscript reference:

MADRAS/D. xxiv. *13449*, 14 ff. Telugu; *13450*, 14 ff. incomplete.
MADRAS/T. vol. iv. part. i. Sanskrit B, *457(i)*, ff. 208a-211b. Telugu. incomplete; vol. x. Sanskrit A, *6066(a)*, ff. 29a-31b. Grantha.
MYSORE/AM. p. 50, *316*, 3ff. Kanarese.
TRI/KS. iv. *954*, 15 ff. Malayalam.

Vararuci-vākya. see VARARUCI.

Vargaghanasāriṇī. वर्गघनसारिणी

An anonymous work dealing with squares and cubes of numbers from 1 to 2680.

Manuscript reference:

BANARAS. p. 267, *128*, 66 ff.

Varṣatantra. वर्षतन्त्र

An anonymous work.

Manuscript reference:

MADRAS/T. vol. v. part i. Sanskrit C. *4276 (a)*, ff. 1a-26a. Telugu.

Varṣavākya. वर्षवाक्य

This anonymous treatise gives the formulæ for arriving at the *Meṣasaṅkrānti*, in week days, *Ghaṭikās*, and *Vighaṭikās* for each of the 60 years commencing from *Prabhava*, i.e. *Kali* 4969. (i.e. 1861 A.D.). It also gives the time of the commencement of each of 12 months in the year.

Manuscript reference:

MADRAS/D. xxiv. *13492*, 9 ff. Grantha. incomplete.

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Vārṣikatantra. see VIDDAṆĀCĀRYA.

Vārṣika-vyākhyāna. see VIDDAṆĀCĀRYA.

Vāsanābhāṣya. see ĀMARĀJA.

Vāsanābhāṣya. see BHĀSKARĀCĀRYA.

Vāsanābhāṣya. see RĀJAGIRI PRAVĀSĪ.

Vāsanābhāṣya. वासनाभाष्य

An anonymous commentary on the *Siddhāntaśiromaṇi* of Bhāskarācārya.

Manuscript reference:

CSC/HS & SG. ix. *173*, 33 ff. Nāgarī. 1782 A.D.; *174*, 186 ff. Nāgarī. 1782 A.D. incomplete.

Vāsanābhāṣya. see SOMEŚVARA.

Vāsanārasāyana. see KṚṢṆĀNANDA.

Vāsanārṇava. see MADANAPĀLA.

Vāsanāsarvasva. see HARIHARA s.o. Āśādhara.

Vāsanāvārtika. see NṚSIṂHA.

VAŚIṢṬHA (3rd. century A.D.)

Vaśiṣṭha-siddhānta or *Vaśiṣṭha-saṃhitā* or *Laghu-vaśiṣṭha-siddhānta.* वशिष्ठसिद्धान्त, वशिष्ठसंहिता, लघुवशिष्ठसिद्धान्त

A small metrical treatise dealing with astronomical matters in 95 stanzas divided into 5 chs. *viz.* (i) Madhyagrahānayanādhikāra, (ii) Spaṣṭādhikāra, (iii) Chāyādhikāra, (iv) Prakīrṇādhyāya and (v) Golādhyāya. This work is ascribed to Vaśiṣṭha who is said to have disclosed this science to Māṇḍarya to supplement what was expounded by Brahman. This work appears to be later than the *Brahmasiddhānta.* There is another *Vṛddha-vaśiṣṭha-siddhānta*, also called *Viśvaprakāśa*, for which see under Vṛddha Vasiṣṭha.

Manuscript reference:

ĄNUP. iv. p. 388, *722*, 9 ff.
BANARAS. p. 258, *2*, ff. 1-5, 11-14
BORS/AB. iii. *334*, 5 ff. Maithili. 1838 A.D.
BU/GD. i. *330*, 3 ff. Nāgarī; *381*, 9 ff. Nāgarī; *382*, 4 ff. Nāgarī.
NWP. *y*. p. 202, *5*, 5 ff. Nāgarī.
PU. ii. *3890*, 4 ff. Nāgarī.

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RTL/MS. p. 172, *5*.
TANJORE/PPS. xvi. *11600*, 5 ff. Nāgarī.
TCC/TA. p. 29, 5 ff. Bengali.
VVRI/VB. p. 80, *2394*, 1 ff. Nāgarī. incomplete.

Printed text, translations etc.

Vaśiṣṭha Siddhānta. Ed. by Vindhyeśvari Prasāda Dube. Benares, 1881. Republished in 1917 (see *Jyautiṣasiddhānta-saṃgraha*).

Vaśiṣṭhasiddhānta, with the commentary *Jagaddīpikā* by Maṛiḍayya Somayājī, Cocanada, 1915.

Study:

DAS, SUKUMAR RANJAN. 'Precession and Libration of the Equinoxes in Hindu Astronomy,' *JASB*, n.s. **23,** no. 3, 403-13, 1927.

PISHAROTI, K. RAMA. 'Śāstras—Practical & Theoretical', *QJMS*, **21,** no. 3, 206-31, 1931.

WINTERNITZ, M. *Geschichte der indischen Litteratur*, **3,** 559, Leipzig, 1922.

Vaśiṣṭha-saṃhitā. see VAŚIṢṬHA.

Vaśiṣṭha-siddhānta. see VAŚIṢṬHA.

Vaśiṣṭhasiddhānta-ṭīkā. see VIŚVANĀTHA DAIVAJÑA S.O. Divākara Daivajña.

Vāstavacandra-śṛṅgonnati-sādhana. see SUDHĀKARA DVIVEDIN.

VAṬEŚVARA ĀCĀRYA. (880 A.D.)

Vaṭeśvara-siddhānta. वटेश्वरसिद्धान्त

An astronomical work in 15 chs.

Printed text, translations etc.

Vaṭeśvara-siddhānta, with Sanskrit, Hindi, Vijñāna bhāṣya upapatti-sahita. Ed. by Ram Swarup Sharma and Pandit Mukund Mishra Jyotishacarya. Published by Indian Institute of Astronomical & Sanskrit Research, New Delhi. First Ed. 1962. [This contains the first three chs. only *viz*., (*i*) Madhyamādhikāra, (*ii*) Spaṣṭādhikāra, (*iii*) Tripraśnādhikāra.]

Vedāṅga-Jyautiṣa. see LAGADHA.

Vedāṅga-Jyotiśśāstra. see VYĀSA.

VEDĀṄGARĀYA. (c. 1627-1658 A.D.)

Pārasīprakāśa. पारसीप्रकाश

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An astronomical work describing the Hindu and Mohammedan methods of computing the months, years, the rising and the setting of the sun and the moon, the lunar asterisms, planetary aspects, eclipses etc. with a vocabulary of Persian and Arabic terms used in astronomy, astrology, chronology, celestial geography and arithmetic, classified under several heads with their Sanskrit synonyms, written in the reign of Shah Jahan (1627-1658 A.D.).

Manuscript reference:

BIK/RM. *700*, 18 ff. Nāgarī.
CP/FK. p. 232, *73*, 32 ff, 1769 A.D.
GUJARAT. iv. p. 156, *238*,14 ff. 1745 A.D.
IO/AK. ii. Part i, *6316*, 1 ff. Nāgarī. 19th century.
IO/JE. v, *2977*, 27 ff. Nāgarī. 1815 A.D.; *2978*, 11 ff. Nāgarī. 1700 A.D. fragment.
MAC/HW. p. 370, *8*.
OUDH. vii. p. 4, *13*, 34 ff. Nāgarī.
PU. ii. *3627*, 8 ff. Nāgarī. 1690 A.D.

VEDĀNTA DEŚIKA.

Bhūgolanirṇaya-savyākhyāna. भूगोलनिर्णयसव्याख्यान

In this work the author gives an idea of the extent of the different worlds including the earth and the heavens, comprised in the cosmic universe and the size of certain mountains. It contains a commentary by the author himself.

Manuscript reference:

MADRAS/D. xxiv. *13465*, 21 ff. Grantha; *13466*, 10 ff. Grantha; Supplemental vol. xxxii. *18165*, 7 ff. Grantha; *18179*, 3 ff. Grantha.

VEṄKAṬĀCĀRYA, alias Veṅkaṭeśa.

Jaiminīyā-sūtra-vyākhyā. जैमिनीयसूत्रव्याख्या

A commentary on the *Jaimini-sūtra* by Jaimini.

Manuscript reference:

GUJARAT. iv. p. 136, 59 ff. 1836 A.D.
UJJAIN. p. 55, *2101*, 80 ff.

VEṄKAṬĀDRI

Kuṭṭakāraśiromaṇi. कुट्टकारशिरोमणि

Manuscript reference:

TANJORE/PPS. xvi. *11354*, 54 ff. Grantha.

Anonymous commentary:

Kuṭṭākāraśiromaṇiṭīkā.

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Veṅkaṭādrināthīya-grahatantra. see NṚSIṂHASŪRI s.ō. Singanārya.

VEṄKAṬA YAJVĀ s.o. Tirumala Yajvā of Vellāla Yallayārya family.

Grahatantra-vivaraṇa. ग्रहतन्त्रविवरण

A commentary on the *Grahatantrâ* of Ahobilanātha.

Manuscript reference:

MADRAS/T. vol. i. part i. Sanskrit B, *457(b)*, ff. 84a-97a. Telugu.

VEṄKAṬEŚA.

1. *Sarvārthacintāmaṇi.* सर्वार्थचिन्तामणि

Manuscript reference:

AS/KBK. p. 216, Nāgarī.

2. *Yogārṇava.* योगार्णव

Manuscript reference:

GUJARAT. iv. p. 182, *386*, 24 ff.

VEṄKAṬEŚA and Raghunātha.

Tattvaviveka-vyākhyā. तत्त्वविवेकव्याख्या

A commentary on the *Siddhāntatattva* of Kamalākara.

Manuscript reference:

PU. ii. *3491*, 40 ff. Nāgarī. incomplete.

VEṄKAṬEŚA KETAKARA. (c. 1898 A.D.)

Jyotirgaṇita. ज्योतिर्गणित

A treatise on astronomy. It has two broad sections. The first section contains 4 chs: (i) Pañcāṅgādhyāya, (ii) Candra-sūryādhyāya, (iii) Grahagaṇitādhyāya, (iv) Nakṣatrādhyāya. The second section has 7 chs: (i) Candragrahaṇādhyāya, (ii) Sūryagrahaṇādhyāya, (iii) Yutyadhyāya, (iv) Lopadarśanādhyāya, (v) Pātādhyāya, (vi) Tripraśnādhyāya, (vii) Kālaviparīṇāmādhyāya.

The main objective of the work is to reform the old and antiquated state of astronomical knowledge of the Hindus and to make it up to date as far as possible. The book embodies the astronomical discoveries and researches made during the last four centuries. For preparing this book, the author has taken help of the works of the eminent astronomers such as Leverrier, Hansen and Newcomb.

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Printed text, translations etc.

Jyotirgaṇita, by Veṅkaṭeśa Ketakara. A treatise on astronomy with illustrations, Poona, 1898.

VIDDAṆĀCĀRYA s.o. Mallapa.

1. *Grahaṇamukura.* ग्रहणमुकुर

Manuscript reference:

M & C/LR, *278*, Nāgarī.

2. *Vārṣikatantra* or *Vārṣikavyākhyāna.* वार्षिकतन्त्र, वार्षिकव्याख्यान

An astronomical work in 11 chs. *viz.* (i) Dhruvamadhyādhyāya, (ii) Grahagatinirṇayādhyāya, (iii) Chāyādhyāya. (iv) Candragrahaṇādhyāya, (v) Sūryagrahaṇādhyāya, (vi) Valilekhanādhyāya, (vii) Mahāpātādhyāya, (viii) Udayāstamayādhyāya, (ix) Grahayutyadhyāya, (x) Bhagrahayutyadhyāya and (xi) Śṛṅgonnatyadhyāya.

Manuscript reference:

M & C/LR. *322*, Nāgarī.

MADRAS/T: vol. i. part i. Sanskrit B, *457(a)*, ff. 1a-83b, Telugu.

MYSORE/AM. p. 50, *19*, ff. 93-149, Grantha. incomplete; *352*, ff. 1-3, 23-40. Nāgarī. incomplete.

VIDYĀDHARA alias, GĀṄGEYA VIDYĀDHARA s.o. Nārāyaṇa of Jīrṇagaḍhapura near Mount Raivataka. (c. 1638 A.D.)

1. *Grahavidyādhara.* ग्रहविद्याधर 1638 A.D.

A short course of instructions for the preparation of almanacs

Manuscript reference:

IO/JE. v. *2961*, 6 ff. Nāgarī.

2. *Pañcāṅgavidyādharī.* पञ्चाङ्गविद्याधरी 1643 A.D. (?)

A short treatise on the computation of time. Composed under the rule of Vīrabhadra of Rājakoṭa.

Manuscript reference:

IO/JE. v. *2960*, 6 ff. Nāgarī. 1726 A.D.

VIDYĀNĀTHA s.o. Śrīnātha Sūri and protegé of Rājā Anūpa Siṃha.

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Jyotpatti-sāra. ज्योत्पत्तिसार

A treatise on geometry.

Manuscript reference:

BIK/RM, *661*, 48 ff. Nāgarī.

Vidvanmanorañjanā. see RĀMAKṚṢṆA DEVA s.o. Sadāśiva Āpadeva.

VIGHNARĀJA.

Bhuvanadīpikā-ṭīkā. भुवनदीपिकाटीका

A commentary on the *Bhuvanadipikā* of Padmaprābhu.

Manuscript reference:

CP/FK. p. 236, *103*, 13 ff. 1759 A.D.

VIJAYANĀTHA.

Grahabhāvādhyāya. ग्रहभावाध्याय

Manuscript reference:

GUJARAT. iv. p. 126, *72*, 12 ff.

VIṂŚAVADANA ŚARMĀ.

Calculations regarding the position of the mars. for the year śaka 1546.

Manuscript reference:

BN/AC. i. *961(vi)*, Bengali. 19th. century.

Viparītagrahaṇa. विपरीतग्रहण

Manuscript reference:

VVRI/VB. *237*, 2 ff. Nāgarī.

Vīramitrodaya. see RĀMA DAIVAJÑA.

Vīramitrodaya-vyākhyā. see ŚIVA.

VĪRASIṂHA GAṆAKA s.o. Kāśīrāja.

1. *Anūpamahodadhi* अनूपमहोदधि

A work on astronomy and mathematics, containing 6 chs. *viz.*, (i) Saṃjñātaraṅga, (ii) Saḍvyaktagaṇita-taraṅga, (iii) Avyaktagaṇita-taraṅga, (iv) Kālamānataraṅga, (v) Ṛtunirṇayataraṅga, and (vi) Saptarṣicārātaraṅga. Written under the patronage of Rājā Anūp Siṃhaji of Bikaner.

Manuscript reference:

ANUP. iv. p. 339, *8*, 8 ff. ch. i. only; *9*, 79 ff. 1682 A.D.,

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ch. ii. only; *10*, 108 ff. 1682 A.D., ch. iii. only; *11*, 45 ff. ch. iv. only; p. 340, *12*, 52 ff. ch. v. only; *13*, 4 ff. ch. vi only; *14*, 66 ff. ch. ii. only; *15*, 2 ff. fragment; *16*, 80 ff. ch. iii. only; *17*, 32 ff. ch. iv only; *18*, 62 ff. ch. v. only; *19*, 63 ff. ch. v. only.

2. *Āryasiddhāntatulyakaraṇa.* आर्यसिद्धान्ततुल्यकरण

Manuscript reference:

ANUP. iv. p. 341, *44*, 32 ff. 1681 A.D.; p. 342, *45*, 26 ff. *46*, 15 ff.

VĪREŚVARA.

Pāṭīvyākhyāna or *Pāṭīgaṇita* or *Līlāvatyudāharaṇa.*

पाटीव्याख्यान, पाटीगणित, लीलावत्युदाहरण

A commentary on the *Līlāvatī* of Bhāskarācārya. The commentary quotes from *Pāṭīratna*, *Gaṇitakaumudī* (1357 A.D.) and from the works of Lakṣmīdāsa Miśra (1501 A.D) and Śrīdharācārya.

Manuscript reference:

AS/KBK. p. 168, Nāgarī.
IO/JE. v. *2818*, 88 ff. Nāgarī.
NOTICES/RM. vi. *2227*, 82 ff. Nāgarī.
RAS/BB/HV. *270*, 32 ff. Nāgarī.

VIṢṆU DAIVAJÑA s.o. Divākara Daivajña and brother of Viśvanātha of Golagrama (c. 1608 A.D.)

1. *Bṛhatcintāmaṇi-vāsanābhāṣya* or *Subodhinī.*

बृहत्चिन्तामणिवासनाभाष्य, सुबोधिनी

A commentary on the *Bṛhatcintāmaṇi* of Gaṇeśa Daivajña.

Manuscript reference:

BM/CB. *462*, 15 ff.
RORI/JM. ii. *5747*, 21 ff. 19th. century.

Printed text, translations etc.

Bṛhat-tithicintāmani with the commentary, *Subodhinī* by Viṣṇu Daivajña. Ed. D.V. Apte. Ānandāśrama Sanskrit Series 120, Poona. 1942.

2. *Sūryapakṣa-śaraṇa-karaṇa.* सूर्यपक्षशरणकरण 1608 A.D.

A *Karaṇa* work mainly based on the *Sūryasiddhānta*, in 14 chs. *viz.*, (i) Madhyagraha, (ii) Spaṣṭagraha, (iii) Praśnatraya, (iv) Candragraha, (v) Sūryagraha, (vi) (Tithi) Patrādgraha, (vii) Candrekṣaṇa, (viii) Astodaya, (ix) Kheṭaprabhā,

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(x) Svaśṛṅgonnati, (xi) Kheṭaikyatā, (xii) Ṛkṣaprabhā, (xiii) Pātasphuṭa and (xiv) without any special title.

Manuscript reference:

AS/KBK. p. 227, Bengali.

IO/JE. v. *2950*, 24 ff. Nāgarī; *2951*, 10 ff. Nāgarī.

PU. ii. *4065*, 15 ff. Nāgarī.

Commentator:

Gopīnātha and Viśvanātha.

Anonymous commentary:

Viṣṇukaraṇodāharaṇa.

VIṢṆUDEVA.

Siddhāntasaudha-vyākhyā. सिद्धान्तसौधव्याख्या

A commentary on the *Siddhāntasaudha* of Paramānanda.

Manuscript reference:

BORS/AB. iii. *418*, 16 ff. 1810 A.D.

Viṣṇukaraṇodāharaṇa. विष्णुकरणोदाहरण 1612 A.D.

An anonymous commentary on the *Saurapakṣasaraṇakaraṇa* of Viṣṇu Daivajña.

Manuscript reference:

IO/JE. v. *2952*, 26 ff. Nāgarī; *2953*, 16 ff. Nāgarī.

Viṣṇukaraṇodāharaṇa. see VIŚVANĀTHA DAIVAJÑA.

Viṣṇusiddhānta. विष्णुसिद्धान्त

An anonymous astronomical work.

Manuscript reference:

TCC/TA. p. 30, 18 ff. Bengali. 18th. century.

Viṣṇusiddhānta-līlāvatī. विष्णुसिद्धान्तलीलावती

An anonymous work.

Manuscript reference:

GUJARAT. iv. p. 196, 455.

VIṢṆU SIṂHA.

Siddhāntasāra. सिद्धान्तसार

An astronomical work.

Manuscript reference:

IO/AK. ii. part i. *6374*, 13 ff. Nepalese. 19th. century.

VIŚVANĀTHA.

Bhāsvatī-udāharaṇa. भास्वतीउदाहरण

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A commentary on the *Bhāsvatī* of Śatānanda.

Manuscript reference:

NU/VK. *1403*, 31 ff. Nāgarī.

VIŚVANĀTHA DAIVAJÑA s.o. Divākara Daivajña. (1578 A.D.)

1. *Grahaṇārthaprakāśika* or *Sūryasiddhāntodāharaṇa*. ग्रहणार्थप्रकाशिका, सूर्यसिद्धान्तोदाहरण

A commentary on the *Sūryasiddhānta*.

Manuscript reference:

ANUP. v. *51*, 185 ff. 1649 A.D.
AS/HS & PS. x. *6944*, 199 ff. Nāgarī. 1799 A.D.
BANARAS. p. 258, *85*, 199 ff. 1799 A.D.
BORS/AB. iii. *43*, 19 ff. Maithili. 1845 A.D.; *44*, 15 ff. Maithili. incomplete; *423*, 109 ff. Maithili. 1845 A.D.; *423A*, 18 ff. Maithili; *423B*, 90 ff. Maithili.
BU/HV. *1452*, 470 ff. Nāgarī.
CP/FK. p. 224, *19*, 136 ff.
NOTICES/RM. viii. *2813*, 142 ff. Maithili. 1848 A.D.
NWP. i. p. 578, *197*, 74 ff. Nāgarī; ii. p. 82, *18*, 82 ff.; p. 149, *42*, 20 ff. Nāgarī; v. p. 50, 128 ff. Nāgarī.
OUDH. v. p. 14, *17*, 394 ff. Nāgarī.
PU. ii. *4077*, 101 ff. Nāgarī; *4078*, 114 ff. Nāgarī. incomplete; *4079*, ff. 115-142, Nāgarī. incomplete
RORI/JM. ii. p. 120, *599*, 150 ff. 1912 A.D.
RTL/MS. p. 177, 200 ff. Kashmiri.
VVRI/VB. p. 81. *2349*, 87 ff. Nāgarī. incomplete.

2. *Grahakautukodāharaṇa*. ग्रहकौतुकोदाहरण

A commentary on the *Grahakautuka*.

Manuscript reference:

CP/FK. p. 226, *23*, 70 ff.

3. *Grahalāghavodāharaṇa* or *Grahalāghava-ṭīkā* or *Grahalāghavavṛtti* or *Grahalāghava-vyākhyā* or *Grahalāghavavivaraṇa*, or *Grahalāghavasiddhāntarahasyodāharaṇa* or *Grahalāghavākhyasiddhāntarahasyodāharaṇa* or *Siddhāntarahasyodāharaṇa*. ग्रहलाघवोदाहरण, ग्रहलाघवटीका, ग्रहलाघववृत्ति, ग्रहलाघवव्याख्या, ग्रहलाघवविवरण, ग्रहलाघवसिद्धान्तरहस्योदाहरण, ग्रहलाघवाख्यसिद्धान्तरहस्योदाहरण, सिद्धान्तरहस्योदाहरण

A commentary on the *Grahalāghava* of Gaṇeśa Daivajña.

Manuscript reference:

ANUP. iv. p. 349; *44*, 54 ff. 1668 A.D.
AS/HS & PS. x. *6856*, 90 ff. Nāgarī. 1793 A.D.; *6857*, 19 ff.

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Nāgarī; *6863*, 51 ff. Nāgarī. 1789 A.D.; *6865*, 50 ff. Nāgarī. 1782 A.D.

AS/KBK. p. 224, Bengali; another copy, see p. 60.

BANARAS. p.262, *68*; *86*.

BIK/RM. *731*, 58 ff. Nāgarī.

BN/AC. i. *304*(*vi*), Bengali. 1840 A.D.

BORS/AB. iii. *57*, 31 ff. Maithili. 1816 A.D.; *57A*, 25 ff. Maithili; *57B*, 39 ff. Maithili. 1843 A.D.; *57C*, 24 ff. Maithili; *57D*, 23 ff. Maithili; *409*, 49 ff. Maithili. 1843 A.D.; *409A*, 53 ff. Maithili. 1859 A.D.; *409B*, 61 ff. Maithili. 1833 A.D.

BU/GD. i. *347*, 95 ff. Nāgarī; *348*, 33 ff. Nāgarī; *349*, 52 ff. Nāgarī.

CENSUS. *4695*, 56 ff. Nāgarī; *4696*, ff. 16-30. Nāgarī. lacks beginning; *4697*, 82 ff. Nāgarī. 1782 A.D.; *4698*, 34 ff. Nāgarī. 1773 A.D.; *4699*, 35 ff. Nāgarī. 1708 A.D. *Sūrya-grahaṇa* section only.

CP/FK. p. 226, *26*, 90 ff. 1800 A.D.

CSC/HS & SG. ix. *9*, 73 ff. Nāgarī; *10*, 34 ff. Nāgarī. incomplete; *11*, 70 ff. Nāgarī; *12*, 70 ff. Nāgarī. incomplete; *164*, 31 ff. Nāgarī. 1828 A.D. incomplete.

GUJARAT. iv. p. 128, *80*, 51 ff. 1796 A.D.; *83*, 59 ff. 1650 A.D.; p. 208, *519*, 90 ff.

IO/JE. v. *2932*, 85 ff. Nāgarī; *2933*, 85 ff. Nāgarī; *2934*, 80 ff. Nāgarī; *2935*, 77 ff. Nāgarī. late 18th. century; *2936*, 15 ff. Nāgarī. 1796 A.D.; *2937*, 95 ff. Nāgarī. c. 1700 A.D. incomplete.

LEIPZIG/TA. *976*, 44 ff. c. 1760 A.D. 6 chs. only; *977*, 65 ff. c. 1840 A.D.; *978*, 4. ff. c. 1840 A.D. 3-8 chs. only; *979*, 20 ff. c. 1860. breaks off in ch. 3.; *980*, 7 ff. c. 1840. breaks off in ch. 2.

MADRAS/T. vol. ii. part i. Sanskrit A, *913*(*a*), ff. 1a-51b, Telugu; *981*(*a*), ff. 1a-4a, Telugu. chs. 1-3 only.

NOTICES/RM. iii. *1339*, 19 ff. Nāgarī; *2456*, 41 ff. Nāgarī. 1789 A.D.

NU/VK. *534*, 92 ff. Nāgarī. 1800 A.D.

NWP. ii. p.112, *5*, 64 ff. Nāgarī.

OUDH. xii. p. 22, *1*, 110 ff. Nāgarī; xiii. p. 62, *11*, 136 ff. Nāgarī.

PU. ii. *3359*, 108 ff; *3360*, 49 ff; *3361*, 53 ff; *3362*, 43 ff. incomplete; *3363*, 43 ff.; *3364*, 46 ff. incomplete; *3365*, ff. 21-85. 1771 A.D. incomplete.

RORI/JM. ii. p. 88, *53*, 50 ff. 18th. century; *54*, *41* ff. 1842 A.D.; *55*, 141 ff. 1930 A.D.; *56*, 62 ff. 1928 A.D.; *57*, 38 ff. 1800 A.D.; p. 118, *577*, 62 ff. 19th. century; p. 119, *578*, 55 ff. 1822 A.D.; *579*, 76 ff. 17th. century.

RTL/MS. p. 158, 134 ff. Kashmiri.

TCC/TA. p. 58, 27 ff. Bengali. 17th century.

UJJAIN. p. 51, *164*, 65 ff.; *2053*, 116 ff.; *2296*, 52 ff.

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VVRI/VB. p. 76, *1541*, 37 ff. Nāgarī. 1710 A.D. incomplete; *2550*, 9 ff. Nāgarī. incomplete; *2604*, 53 ff. Nāgarī. 1741 A.D.; *1651*, 14 ff. Nāgarī. incomplete; *4733*, 54 ff. Nāgarī.
ZDMG/33. p. 693.

Printed text, translations etc.

Grahalāghava Karaṇa with the commentaries of Mallāri, Viśvanātha and Sudhākara Dvivedin. Ed. Sudhākara Dvivedin. Benares. 1904.

4. *Karaṇakutūhalodāharaṇa* or *Brahmatulyodāharaṇa* or *Brahmatulyasiddhānta-vṛtti*. करणकुतूहलोदाहरण, ब्रह्मतुल्योदाहरण, ब्रह्मतुल्यसिद्धान्तवृत्ति

A commentary on the *Karaṇakutūhala* of Bhāskarācārya.

Manuscript reference:

CENSUS. *4731*, 108 ff. Nāgarī. 1796 A.D.; *4732*, 16 ff. Nāgarī. incomplete; *4733*, 63 ff. Nāgarī.
CP/FK. p. 234, *99*, 73 ff.
GUJARAT. iv. p. 166, *296*, 38 ff. 1796 A.D.; p. 168, *300*, 65 ff.
NWP. i. p. 524, *56*, 35 ff. Nāgarī.
PU. ii. *3734*, 73 ff. Nāgarī; *3735*, 52 ff. Nāgarī.
VVRI/VB. p. 76, *2507*, 44 ff. Nāgarī. incomplete.

5. *Kheṭakutūhalodāhṛti*. खेटकुतूहलोदाहृति 1216 A.D.

A commentary on the *Kheṭakutūhala* of (?)

Manuscript reference:

RORI/JM. ii. p. 87, *46*, 69 ff. 19th. century.

6. *Makarandodāharaṇa* or *Makarandasyodāhṛti*. मकरन्दोदाहरण, मकरन्दस्योदाहृति

A commentary on the *Tithipatra* of Makaranda.

Manuscript reference:

AS/HS & PS. x. *6896*, 40 ff. Nāgarī. 1725 A.D.
BIK/RM. *677*, 13 ff. Nāgarī.
BORS/AB. iii. *252*, 19 ff. Maithili. 1736 A.D.
CP/FK. p. 236, *105*, 22 ff. 1818 A.D.
CSC/HS & SG. ix. *84*, 18 ff. Nāgarī; *85*, 18 ff. Nāgarī; *86*, 28 ff. Nāgarī.
GUJARAT. iv. p. 170, *316*, 36 ff.
IO/AK. ii. part i. *6296*, 25 ff. Nāgarī. 1800 A.D.
IO/JE. v. *2957*, 26 ff. Nāgarī. 1785 A.D.
LEIPZIG/TA. *983*, 15 ff. 1853 A.D.
NWP ii. p. 147, 41 ff.
RORI/JM. ii. p. 104, *334*, 19 ff. 19th century; *335*, 27 ff. 1867 A.D.; *336*, 57 ff. 1936 A.D.

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VVRI/VB. p. 79, *2652*, 16 ff. Nāgarī. incomplete.

Printed text, translations etc.

Makarandodāharaṇa. Ed. Banarasi Prasad, Benares Amar Press, 1940 Sam.

7. *Mitāṅka*. मिताङ्क

A treatise on the compilation of almanacs.

Manuscript reference:

OUDH. v. p. 12, *9*, 26 ff. Nāgarī.

8. *Pātasāriṇīṭīkā*. पातसारिणीटीका

A commentary on the *Pātasāriṇī* of Gaṇeśa Daivajña.

Manuscript reference:

AS/HS & PS. x. *6948*, 19ff. Nāgarī. 1789 A.D.
NEPAL/HS. i. p. 205, *1167*, 11 ff. Nāgarī. 1632 A.D.
PU. ii. *3623*, 10 ff. Nāgarī. 1690 A.D.; *3624*, 7 ff. Nāgarī, 1878 A.D.; *3625*, 5 ff. Nāgarī.

9. *Rāmavinododāharaṇa*. रामविनोदोदाहरण

A commentary on the *Rāmavinoda* of Rāma Daivajña.

Manuscript reference:

AS/HS & PS. x. *6909*, 9 ff. Nāgarī. 1801 A.D.
BANARAS. p. 264, *73*, 21 ff.
BU/HV. *1442*, ff. 1-7, 16. Nāgarī.
CP/FK. p. 240, *138*, 15 ff. 1794 A.D.
PU. ii. *3865*, 19 ff. Nāgarī. incomplete; *3866*, ii. 16 ff. Nāgarī. incomplete.

10. *Saurapakṣagaṇitavyākhyā* or *Viṣṇukaraṇodāharaṇa*.

सौरपक्षगणितव्याख्या, विष्णुकरणोदाहरण

A commentary on the *Sūryapakṣaśaraṇākaraṇa* of Viṣṇu Daivajña.

Manuscript reference:

BANARAS. p. 264, *61*, 38 ff. 1669 A.D.; *66*, 21 ff. incomplete.
TANJORE/PPS. xvi, *11358*, 32 ff. Nāgarī.

11. *Śiromaṇyudāharaṇa*. शिरोमण्युदाहरण

A commentary on the *Siddhāntaśiromaṇi* of Bhāskarācārya.

Manuscript reference:

NWP. i. p. 520, *40*, 88 ff. Nāgarī.

12. *Somasiddhāntaṭīkā*. सोमसिद्धान्तटीका

A commentary on the *Somasiddhānta*.

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Manuscript reference:
NWP. ii. p. 151.

13. *Tithicintāmaṇikoṣṭhakāni.* तिथिचिन्तामणिकोष्ठकानि
Tables based on the *Tithicintāmaṇi* of Gaṇeśa Daivajña.
Manuscript reference:
CENSUS. *4708*, 39 ff. Nāgarī.

14. *Tithicintāmaṇi-udāharaṇa* or *Laghutithicintāmaṇi-udāharaṇa.* तिथिचिन्तामणि-उदाहरण, लघुतिथिचिन्तामणिउदाहरण
A commentary on the *Tithicintāmaṇi* of Gaṇeśa Daivajña.
Manuscript reference:
BM/CB. *463*, 4 ff. Nāgarī. 1829 A.D.
PU. ii. *3533*, 8 ff. Nāgarī. 1854 A.D.

15. *Tithyādicintāmaṇi.* तिथ्यादिचिन्तामणि
Manuscript reference:
CENSUS. *4709*, 2 ff. Nāgarī.

16. *Vaśiṣṭhasiddhānta-ṭīkā.* वशिष्ठसिद्धान्तटीका
A commentary on the *Vaśiṣṭhasiddhānta* ascribed to Vaśiṣṭha.
Manuscript reference:
NWP. ii. p. 151.

Viśvaprakāśa. see VṚDDHA VAŚIṢṬHA.

VIŚVEŚVARA.

Līlāvatyudāharaṇa. लीलावत्युदाहरण
A commentary on the *Līlāvatī* of Bhāskarācārya.
Manuscript reference:
NOTICES/RM. vi. *2227*, 82 ff. Nāgarī.
NU/VK. *1895*, ff. 17-67, Nāgarī.

VIŚVEŚVARANĀTHA.

Bhāsvatī-vyākhyā. भास्वतीव्याख्या
A commentary on the *Bhāsvatī* of Śatānanda.
Manuscript reference:
OUDH (1893), p. 82; *29*, 160 ff. Nāgarī.

Vivaraṇa. विवरण
An anonymous commentary on the *Karaṇottama.* of Acyuta.

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Manuscript reference:
MADRAS/T. vol. i. part i. Sanskrit C, *663(a)*, ff. 1a-16a, Grantha.

VOPADEVĀCĀRYA.

Tithi-siddhi-kāmadhenu. तिथिसिद्धिकामधेनु

Manuscript reference:
VVRI/VB. *2368*, 2 ff. Nāgarī.

VRAJABHŪṢAṆA.

1. *Pārasīprakāśavinoda.* पारसीप्रकाशविनोद

Manuscript reference:
CENSUS. *4780*, 31 ff. Nāgarī. 1828 A.D.

2. *Pārasīvinoda.* पारसीविनोद

A vocabulary of astronomical terms in Arabic with their Sanskrit equivalents.

Manuscript reference:
OUDH. iv. p. 13, *9*, 16 ff. Nāgarī.

VṚDDHA s.o. Jayadeva and grandson of Balabhadra Sūri. (c. 1680 A.D.).

Sābhra-nirabhra-vyākhyā. साभ्रनिरभ्रव्याख्या 1680 A.D.

A dissertation on the solar and lunar eclipses.

Manuscript reference:
BORS/AB. iii, *399*, 4 ff. Maithili.

VṚDDHA GARGA. (1st. century A.D.)

Vṛddha-Gargasaṃhitā. वृद्धगर्गसंहिता

One of the earliest astronomical Saṃhitās. The first manuscript of AS/HS & PS. referred to below, abruptly ends at the 12th. chapter. The first 11 chs. are however noted. They are: (i) Sūryacāra, (ii) Candracāra, (iii) Kujacāra, (iv) Budhacāra, (v) Gurucāra, (vi) Śukracāra, (vii) Śanicāra, (viii) Rāhucāra, (ix) Maṇḍala, (x) Saṃvatsara, (xi) Śaśyātabdaphala.

Manuscript reference:
AS/HS & PS. x. p. 127, *6958*, 19 ff. Nāgarī. incomplete; *6958(I)*, another exact copy of the previous one, 13 ff. Nāgarī; *6958(II)*, 22 ff. Nāgarī. fragment; *6958(III)*, ff. 54-62, Nāgarī.

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VṚDDHA VAŚIṢṬHA (2nd. century A.D.)

1. *Gaṇitaskandha.* गणितस्कन्ध

Manuscript reference:

ANUP. iv. p. 346, *103*, 50 ff. 1680 A.D.

2. *Viśvaprakāśa* or *Vṛddhavaśiṣṭha-siddhānta.* विश्वप्रकाश, वृद्धवशिष्ठसिद्धान्त

An astronomical treatise in 13 chs. viz., (i) Madhyamādhikāra, (ii) Spaṣṭādhikāra, (iii) Tripraśnādhikāra, (iv) Candra-grahaṇādhikāra, (v) Sūryagrahaṇādhikāra, (vi) Parilekhādhikāra, (vii) Tārāgrahayogādhikāra, (viii) Nakṣatra-dhruvādhikāra, (ix) Grahodayāstādhikāra, (x) Śṛṅgonnatya-dhikāra, (xi) Pātādhikāra, (xii) Bhūgolādhikāra, (xiii) Graha-kakṣādhikāra.

Manuscript reference:

AS/PS & HS. x. *6882*, 43 ff. Nāgarī.
IO/JE. v. *2766*, 29 ff. Nāgarī. 1807 A.D.
MAC/HW. p. 163, *11*, Nāgarī.
NOTICES/RM. v. *1903*, 205 ff. Nāgarī.
PU. ii. *3960*, 40 ff. Nāgarī. incomplete.

Printed text, translations etc.

Jyautiṣasiddhānta-saṅgraha, a collection of ancient Hindu astronomical works. Somasiddhānta, Brahmasiddhānta and Vṛddhavaśiṣṭha Siddhānta. Ed. by Vindhyeśvarī Prasāda Dviwedi. fasc. i, ii. Banares, 1912, 1917. Benares Sanskrit Series nos. 152, 154.

Vṛddhavaśiṣṭha-siddhānta. see VṚDDHA VAŚIṢṬHA.

VṚNDĀVANA ŚUKLA.

1. *Bhāsvatyudāharaṇa.* भास्वत्युदाहरण

A commentary on the *Bhāsvati* of Śatānanda.

Manuscript reference:

NWP. i. p. 558, *149*, 28 ff. Nāgarī.

2. *Līlāvaṭī-ṭīkā.* लीलावतीटीका

A commentary on the *Lilāvatī* of Bhāskarācārya.

Manuscript reference:

NWP. i. p. 536, *85*, 12 ff. Nāgarī.

3. *Pāṭīsāra-ṭīkā.* पाटीसारटीका

A commentary on the *Pāṭīsāra.*

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Manuscript reference:
NWP. i. p. 520, *39*, 14 ff. Nāgarī.

VYAṄKAṬEŚVARA DĪKṢITA.

Śulbamīmāṃsā. शुल्बमीमांशा

A commentary on the *Śulbasūtra.* of Baudhāyana.

Manuscript reference:
AS/HS. p. 517, *605*, 83 ff. Nāgarī. complete.
BURNELL. p. 28, *99*, 161 ff. Grantha.
IO/JE. part i. *291*, 50 ff. Nāgarī.

VYĀSA.

Vyāsasiddhānta or *Vedāṅga-jyotiśśāstra.* व्याससिद्धान्त. वेदाङ्गज्योतिश्शास्त्र.

A treatise on mythical cosmography, ascribed to Vyāsa in 3 chs. *viz.*, (i) Bhuvanakośa-varṇana, (ii) Kakṣādhyāya and (iii) Golādhyāya. This work appears to be a part of *Vyāsasmṛti*, cf. the colophon of BERLIN Ms. which reads, '*iti śrīvedavyāsakṛtadharmaśāstre vyāsasmṛtau vedāṅgamadhye golādhyāyaḥ.*'

Manuscript reference:
BANARAS. p. 258, *7*, 9 ff. 1879 A.D.
BERLIN. ii. part i, *1738*, 16 ff. *Golādhyāya* only.
BU/GD. i. *383*, 6 ff. 1860 A.D.
GUJARAT. iv. p. 124, *60*, 12 ff. *Golādhyāya* only; p. 196, *862*.
NOTICES/RM. iv. *1567*, 15 ff. Nāgarī.
NWP. v. p. 88, 12 ff. Nāgarī; p. 202, 9 ff. Nāgarī.

VYĀSAGAṆAPATI.

Sārasaṅgraha. सारसङ्ग्रह

Manuscript reference:
GUJARAT. iv. p. 206, *512*, 51 ff.

Vyāsasiddhānta. see VYĀSA.

YĀDAVA (c. 1665 A.D.)

1. *Grahaprabodhasāriṇī.* ग्रहप्रबोधसारिणी

Astronomical tables based on the *Grahaprabodha* of Nāgeśa.

Manuscript reference:
CENSUS. *4777*, 4. ff. Nāgarī.

2. *Udāharaṇa.* उदाहरण 1665 A.D.

A commentary on the Grahaprabodha of Nāgeśa.

Manuscript reference:
RAS/BB/HV. *233*, 11 ff. Nāgarī.

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Yājuṣa-jyautiṣa, Ārca-Jyautiṣa.

याजुष-ज्यौतिष, आर्चज्यौतिष

These two works summarise the astronomical knowledge of the Vedic Hindus upto, say the 2nd. century A.D., i.e. till the time of composition of the astronomical Siddhāntas. The characteristic features are the elaboration of a five-yearly luni-solar cycle comprising 1830 civil days, 1835 sidereal days, 1800 solar days, 62 synodic months, 5 solar revolutions and 67 lunar revolutions. According to the system taught in these two works, the year-length works out to 366 days and the synodic month to $29\frac{16}{31}$ days. The nakṣatra space is given as one-twentyseventh of the ecliptic.

Commentators:

Samākara Śeṣa, Sudhākara Dvivedin.

Printed text, translations etc.

Yājuṣa-jyautiṣa with the *Bhāṣya* of Somākara Śeṣa and Sudhākara Dvivedin and *Ārca-jyautiṣa* with the *Bhāṣya* of Sudhākara Dvivedin and Muralīdhara Jhā's explanatory notes-Ed. by Sudhākara Dvivedin, Benares, 1908.

Study:

DATTA, B. 'Vedic Mathematics', *The Cultural Heritage of India*, **3**, 378-401, Ramakrishna Centenary Committee, Calcutta, 1937.

SEN GUPTA, P. C. 'Hindu Astronomy', *The Cultural Heritage of India*, **3**, 341-377, Ramakrishna Centenary Committee, Calcutta, 1937.

YALLAYA or Yallācārya s.o. Śrīdharācārya and pupil of Sūrya.

1. *Āryabhaṭīyavyākhyāna.* आर्यभटीयव्याख्यान

This is not a direct commentary on the *Āryabhaṭīya* of Āryabhaṭa I but written as a supplement to the commentary by Sūryadeva Yajvan. Yallaya says that the commentary by Sūryadeva Yajvan is obscure and so he gives first the commentary of Sūryadeva Yajvan and then adds his own notes with illustrations; cf. MADRAS/D. xxiv. *13393*, where an extract is given.

Manuscript reference:

IO/AB. ii. part i, *6270*, ff. 60-15. Grantha. 1810 A.D.
MADRAS/D. xxiv. *13393*, 254 ff. Grantha.

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2. *Jyotiṣadarpaṇa.* ज्योतिषदर्पण

Manuscript reference:
HULTZSCH. i. *661*, 225 ff. Telugu.
PU ii. *3465*, 192 ff.

3. *Kalpavallī* or *Bālaprabodha.* कल्पवल्ली, बालप्रबोध
A commentary on the Sūryasiddhānta.

Manuscript reference:
HULTZSCH. ii. *673*, 198 ff. Telugu.
IO/AB. ii. part i, *6284*, 88 ff. Grantha. 18th. century.
M & C/LR. *336*, Nāgarī.
MAC/HW. p. 163, *7*, Grantha.
MADRAS/T. vol. ii. part i. Sanskrit C, *1708*, 83 ff. Telugu. 1915-16 A.D.
TAṆJORE/PPS. xvi. *11518*, 5 ff. Nāgarī; *11662*, 37 ff. Nāgarī.

4. *Laghumānasakalpalatā.* लघुमानसकल्पलता
A commentary on the *Laghumānasa* of Mañjulācārya.

Manuscript reference:
MADRAS/D. xxiv. *13475*, 63 ff. Telugu; *13476*, 32 ff. Telugu. incomplete.
MADRAS/T. xi. *7705*, ff. 16-44. incomplete.

YALLĀCĀRYA.

Gaṇita-saṅgraha. गणितसङ्ग्रह
A treatise on arithmetic.

Manuscript reference:
M & C/LR. *2879*, Hale Kannaḍa.

Yantracintāmaṇi. see BHAVĀNĪŚAṄKARA.

Yantracintāmaṇi. see CAKRADHARA s.o. Varuṇa.

Yantracintāmaṇi. see DĀMODARA BHAṬṬA.

Yantracintāmaṇi. see JAGADDAIVAJÑA.

Yantracintāmaṇi. see RATNĀKARA.

Yantracintāmaṇi. यन्त्रचिन्तामणि
An anonymous work.

Manuscript reference:
GUJARAT. iv. p. 180, *373*, 63 ff.

Yantracintāmaṇi-dīpikā. see HARIŚAṄKARA.

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Yantracintāmaṇiṭīkā. see RĀMA DAIVAJÑA.

Yantracintāmaṇi-vivaraṇa. see CAKRADHARA s.o. Varuṇa.

Yantracintāmaṇi-vivṛti. see PARAMĀSUKHA.

Yantracintāmaṇyudāharaṇa. see KṚPĀRĀMA MIŚRA s.o. Lakṣmīnārāyaṇa.

Yantradīpikā. see RĀMA DAIVAJÑA s.o. Madhusūdana.

Yantrādhyāyavivṛti. see RĀMACANDRA.

Yantraghaṭanā. यन्त्रघटना

An anonymous work.

Manuscript reference:

PU. ii. *3827*, 7 ff. Nāgarī.

Yantraprakāśa. see MADANAPĀLA.

Yantraprakāśa. see RĀMACANDRA.

Yantraprakāśa-ṭīkā. see RĀMACANDRA.

Yantrarāja. see JAYASIṂHA.

Yantrarāja. see MAHENDRA SŪRI.

Yantrarāja. यन्त्रराज

Manuscript reference:

PU. ii. *3830*, ff. 18-30, Nāgarī. incomplete.

Yantrarājagama. see MAHENDRA SŪRI.

Yantrarājagama. यन्त्रराजगम

An anonymous work.

Manuscript reference:

OUDH. (1890). p. 138, *158*, 74 ff. Nāgarī.

Yantrarājapaddhati. see MATHURĀNĀTHA ŚUKLA.

Yantrarājaprabhā. see *Yantrarājaracanā.*

Yantrarāja-racanā. यन्त्रराजरचना

Printed text, translations etc.

A work on Hindu astronomy edited with Sanskrit commentary '*Yantraprabhā*' by Kedāranātha Jyotirvid, Rājasthāna Purātana Granthamālā no. 5. Jaipur, Rajasthan Oriental Research Institute. 1953.

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Yantrarāja-racanā. see MALAYENDU.

Yantrarājaṭīkā. see GOPĪRĀJA.

Yantrarājaṭīkā. see MALAYENDU.

Yantrarājaṭīkā. see MATHURĀNĀTHA ŚUKLA.

Yantraratnāvalī. see PADMANĀBHA s.o. Narmada.

Yantrasāra. see NANDARĀMĀ.

YAVANĀCĀRYA.

Nakṣatra-cūḍāmaṇi. नक्षत्रचूडामणि

Manuscript reference:
CP/HL. p. 222, *2393, 2394, 2395.*

YOGADHYĀNA MIŚRA (c. 1873 A.D.)

Kṣetra-tattva-pradīpikā. क्षेत्रतत्त्वप्रदीपिका 1873 A.D.

This work in 5 chs. purports to be a Sanskrit rendering of Hutton's Euclidean Geometry, made at the instance of F. Troyer who was then Secretary of the Sanskrit College, Calcutta.

Manuscript reference:
MADRAS/D. xxiv. *13404,* 108 ff. Telugu.

YOGARĀJA.

Yogaratnāvalī. योगरत्नावली

Manuscript reference:
CP/HL. p. 395, *4434.*

Yogaratnāvalī. see YOGARĀJA.

Yogārṇava. see VEṄKAṬEŚA.

YOGEŚVARA DAIVAJÑA.

Tithicintāmaṇiṭīkā. तिथिचिन्तामणिटीका

A commentary on the *Tithicintāmaṇi* of Gaṇeśa Daivajña.

Manuscript reference:
NU/VK. *820,* 8 ff. Nāgarī. 1843 A.D.

YOGI.

Sūryasiddhānta-tantra-pradīpa. सूर्यसिद्धान्ततन्त्रप्रदीप

Manuscript reference:
TRI/KS. iv. *978,* 9 ff. Malayalam. breaks off in ch. 8.

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YOGIBHAṬṬA.

Pañcāṅga-tattva. पञ्चाङ्गतत्त्व
A work on almanac making.

Manuscript reference:
GUJARAT. iv. p. 152, *211*, 3 ff. 1828 A.D.

YOGĪNDRA.

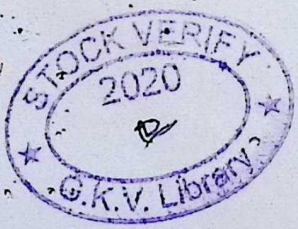
Bhāsvatyudāharaṇa. भास्वत्युदाहरण
A commentary on the *Bhāsvatī* of Śatānanda.

Manuscript reference:
BORS/ABS iii. *237*, 6 ff. 1854 A.D.

Yugapramāṇa. युगप्रमाण
An anonymous work.

Manuscript reference:
OUDH. v. p. 12, *11*, 10 ff. Nāgarī.

Yuktibhāṣā. see *Gaṇitayuktibhāṣā.*



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